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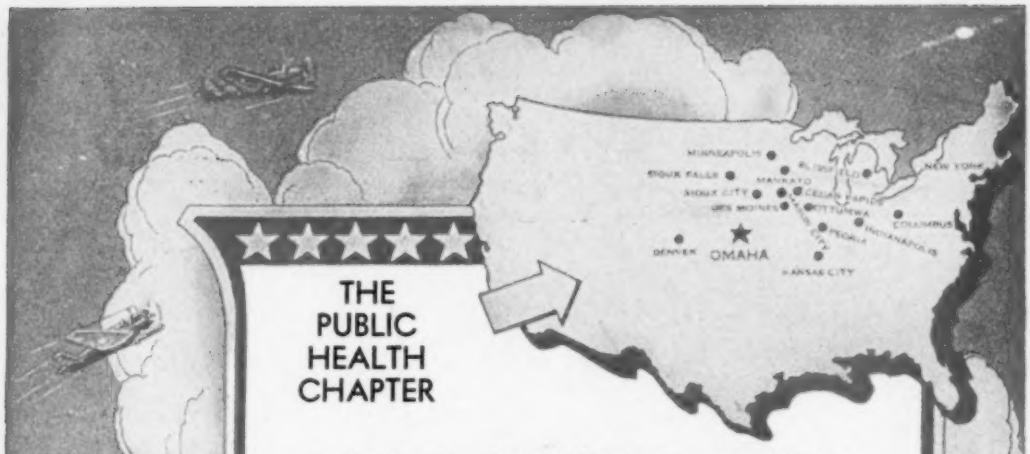

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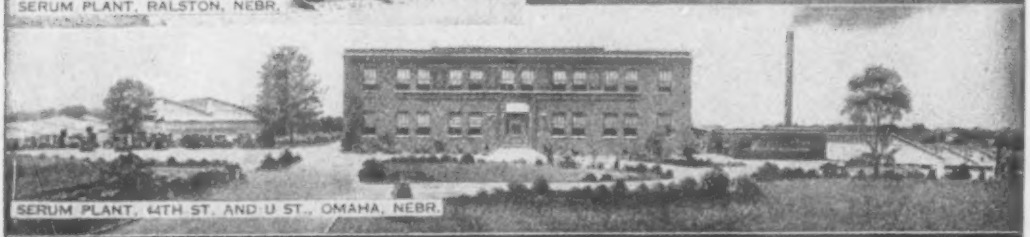

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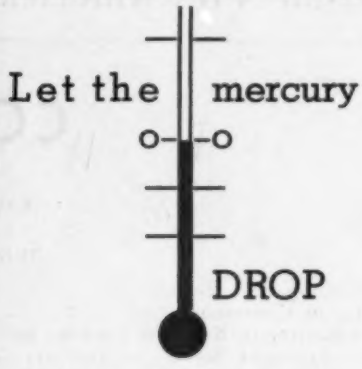

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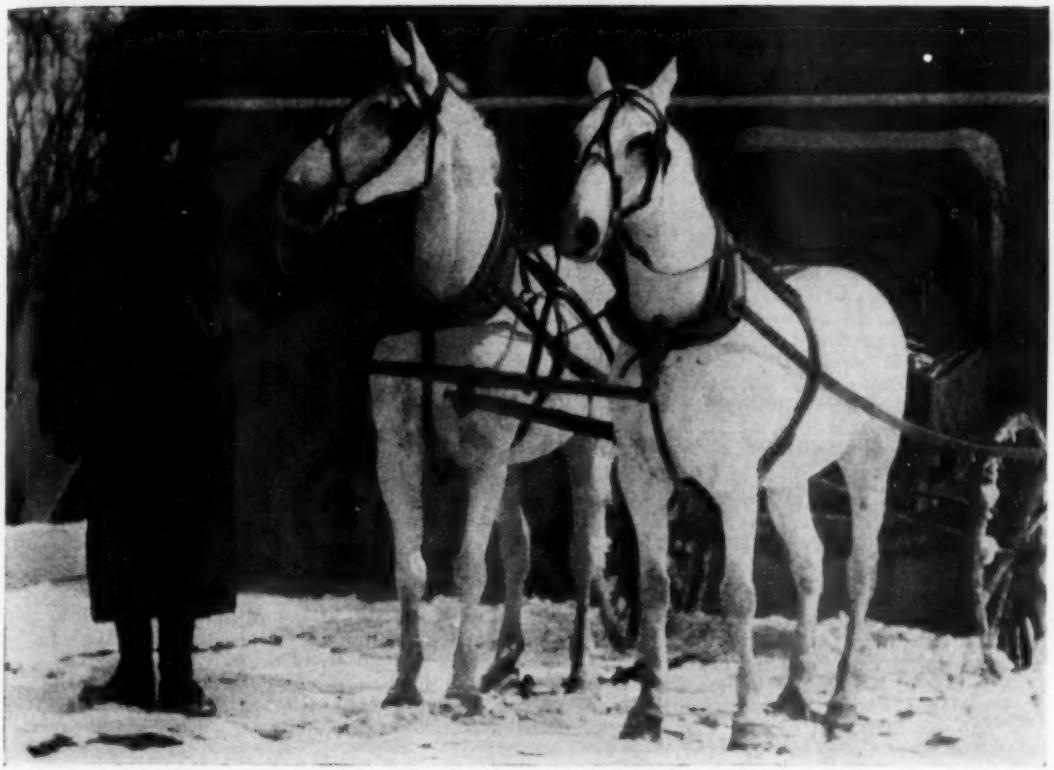

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Panel Discussion on Veterinary Public Health

At the Cincinnati Session of the Association the following panel discussion was conducted in the Section on Sanitary Science and Food Hygiene. The members of the panel were Dr. L. E. Burney, Indianapolis, Ind., moderator; Dr. C. S. Bryan, East Lansing, Mich.; Dr. N. J. Miller, Eaton, Colo.; and Dr. J. H. Steele, Washington, D. C.

MODERATOR L. E. BURNEY (Indianapolis, Ind.).—Ladies and Gentlemen, Dr. Bryan, Dr. Steele, and Dr. Miller are the experts on the program. Dr. Steele asked that each of us on the panel prepare a brief, general statement. Dr. Bryan, will you begin the program?

DR. C. S. BRYAN (East Lansing, Mich.).—Thank you. All members of the veterinary profession may contribute a great deal to the public health of a community. The practitioner can favorably influence rural public health in his recommendations to clients regarding the disposal or utilization of food-producing animals that become injured or nonprofitable as a result of disease, in addition to his advice regarding livestock diseases transmissible to man.

Although many people believe that the veterinarian who is a member of a teaching or regulatory staff is more directly concerned with the public health of a community, the ultimate success of any program depends upon the coöperation between members of the veterinary profession, and between the profession and other agencies. Specifically, the practitioner can render a real service to the public in the field of dairy hygiene, a field that is often left to the staff veterinarian. In my opinion, the production of sanitary milk is just as important as a diseased animal and its treatment. Experience has shown that the dairyman, the dairy industry, and the community appreciate such service and are willing to pay for it.

As I see it, the veterinary profession, in the future, will be able to contribute more and more to the public health program. I thank you.

MODERATOR BURNEY.—Thank you, Dr. Bryan. Those of us in the public health field have been particularly interested in the new legislation and the organizational procedure that has been established recently in Colorado. The same action should be taken in many other states. It has been done to a certain extent in Indiana, but not on such a large scale as in Colorado. Dr. Miller was a member of the committee that brought about this legislation in Colorado, and I am sure he is extremely competent to discuss the subject for us this afternoon. Dr. Miller!

DR. N. J. MILLER (Eaton, Colo.).—Thank you. I have been in the Colorado legislature for three terms. I have been interested in the public health of Colorado and have attempted, during the last several years, to assist in making improvements. I was appointed to the Governor's Postwar Committee on Public Health in Colorado and have had the good fortune to assist Dr. Sabin in her work as chairman of this committee. I had the privilege of working on the Executive Board of this committee.

It is the duty of all veterinarians to be concerned about public health in their respective states and that is what prompted me to work on this project.

We enlarged our public health program in Colorado; we made it a division of public health that recognized the work of the veterinarian in the State Board of Health. We are fortunate in having a veterinarian appointed as a member of the State Board of Health in Colorado.

MODERATOR BURNEY.—Thank you, Dr. Miller. There are approximately 60 diseases transmissible from animals to man,—parasitic, bacterial, and virus diseases. Naturally, the veterinarian has the outstanding rôle in preventing the transmission of such diseases. Public health agencies, as a whole, probably have not used the veterinarian as much as they could have for the benefit of the whole program. The same is probably true of some of the other scientific groups.

In Indiana, we have a veterinarian on our nine-member Executive State Board of Health. I suspect that Colorado and Indiana are two of a very few states that have a veterinarian on the state health board. We have two vet-

erinarians in the State Board of Health as working staff members and we have budgeted two additional members. They will be working in our food and drug program and in our dairy and dairy products program.

Indiana is peculiar in that we do not have a department of agriculture and, as a result, the State Board of Health carries on most of the functions, with reference to food, drug, milk, and dairy products, that ordinarily might come under a department of agriculture.

We have enjoyed the professional assistance and advice that these staff members who are veterinarians have given us. Eventually, we hope to have at least seven on our staff; at the present time, even though we have a budget, we are unable to find veterinarians to fill those positions. We feel that, despite the great help veterinarians have rendered in public health work in the past, they will have an even greater rôle in the future—that rôle to be restricted only by the number of veterinarians available for such positions.

We will now answer questions. The first is: How can the various public health agencies in which veterinarians are engaged directly or indirectly be coördinated more effectively? Dr. Miller, will you answer that question?

DR. MILLER.—I will answer that by citing our setup in Colorado. Our program allowed the establishment of county units which were branches of the state health department, and permitted the employment of local veterinarians in the county health units. The supervision of water supply comes under the direction of the state board of health and in our setup many departments under the division of public health are unnecessary because the local veterinarians perform these duties.

I don't know if that answers your question. I don't know the conditions which exist in the different states. But, in Colorado, all of the meat and milk inspection is either handled through the state organization or through the county units which are subdivisions of the state public health service.

DR. J. H. STEELE (Washington, D. C.).—May I comment on that, Dr. Burney? I think there should be approved liaison between veterinarians who are in public health work *per se*. That is, veterinarians who are in charge of local milk and food inspection programs and are working with the local health departments. Many times they will run into an animal disease problem that is of significance to public health, but the department of health is not charged with the control of the domestic animal diseases and in that case, it will be necessary to refer the information to, and ask for assistance from, the state veterinarian, the state livestock sanitary board, or the agency which is responsible for animal disease control. If we could get that type of liaison established in our local government units, we would have improved utilization of the veterinary services in protecting the health of the community.

MODERATOR BURNEY.—The last Indiana legislature asked us informally if we could provide space in our new building for the livestock sanitary board and the state veterinarian, and arrangements have been made to house them in our new building; not under the supervision of, but housed with, the state board of health. Our building is out with the medical center so that makes it the more advantageous and makes for still better coöperation between the two.

The next question: Why cannot the name, "Section on Sanitary Science and Food Hygiene," be changed to "Veterinary Public Health?"

DR. STEELE.—That question has come up before the Executive Board of the AVMA in previous years, and we understood that the Executive Board was of the opinion that they would be limiting the scope of this section too much if they confined it to public health or used that title for it. I understand there will be a motion this year to change it to the Section on Sanitary Science and Public Health.

MODERATOR BURNEY.—Does anyone care to comment?

DR. E. S. TIERKEL (Auburn, Ala.).— I would like the moderator to go through the audience if possible and get the individual reactions as to whether we are getting redundancy in using the terms Sanitary Science and Public Health. We might get some concrete suggestions.

MEMBER.—I suggest that both alternatives be placed before the group.

DR. BOLTON.—I move we don't quibble about titles. We know what we are doing, regardless of what it may be called.

DR. VAUGHN.—I agree.

DR. M. D. BAUM (Denver, Colo.).—If we are going to be consistent and follow the pattern of the other agencies, the logical name is Public Health Section. I don't understand how "public health" can be interpreted as narrow for public health embraces food, hygiene, sanitation, and many other things. Actually, we are confining its meaning with the present name.

DR. STEELE.—We can not take that up at this time. It is within the jurisdiction of the Executive Board of the AVMA to determine the names of the sections. You who are interested can discuss the question with your representative on the Executive Board.

MODERATOR BURNEY.—Dr. Bryan, I believe you are qualified to answer the next question. What real progress is being made regarding the reporting of animal diseases?

DR. BRYAN.—I think that more and more diseases are being reported through the normal channels that are now available, although you and I both know of exceptions. The education of the public on the part veterinarians play in

their community has a lot to do with the reporting of animal diseases.

DR. MILLER.—In my opinion, this depends largely upon the action or the encouragement of the state livestock sanitary official. That will vary greatly in the different states. Some of our authorities are more active in the requests than others and probably diseases are reported more in some states than in others.

DR. STEELE.—I understand an interesting study has been going on in Iowa, Dr. Foust.

DR. H. L. FOUST (Ames, Iowa).—Yes, that is true. They have been studying a number of farms for incidence of disease, but as far as reporting the disease, I can't answer that. They are now studying the results of the survey, and a report should be available in the next two or three months.

DR. STEELE.—We have the same problem with animal diseases that the physician and the medical health officer have with human disease—the responsibility for reporting animal diseases will go back to the local practitioner. He is the man who comes in contact with them and he is the logical source of information, in fact, we have no other source because he is the man who makes the diagnosis.

We do have reporting of tuberculosis and brucellosis by the Bureau of Animal Industry, but a disease such as rabies is reported very inadequately. That naturally goes back to the veterinarian who makes the clinical diagnosis.

Dr. Burney, do you not have the same experience with physicians throughout the states in reporting human diseases?

MODERATOR BURNEY.—Unfortunately, we do have that difficulty in reference to most human diseases. About three years ago, one out of every four cases dying of tuberculosis was reported previously. But, through physicians in charge of that work, through physicians in state work, and through the county medical officers, and the county medical societies, we have improved to the point where over 50 per cent of the patients dying with tuberculosis have been previously diagnosed and reported. That still seems low, but we will need a few more years to continue improvement.

Many physicans do not report because they feel nothing is done with the report and they don't understand the reason for requesting it. A great deal of educational work must be done by those of us on the boards of health. It is rather discouraging progress, though, as far as the reporting of human disease is concerned.

DR. VAUGHN.—Is that a matter of education or legislation?

MODERATOR BURNEY.—We have legislation. Tuberculosis is a reportable disease by law and so are the venereal diseases, the contagious diseases such as scarlet fever, whooping cough, diphtheria, and yet, I doubt if 1/1000 of the cases of gonorrhea are reported. The reporting of scarlet fever is limited. Until we can get a fulltime public health officer and nurses in the county who will contact the physicians and ask how many cases of t.b., diphtheria, whooping cough there have been that week, we will not be able to get them to report. It takes someone on the job locally to do it. I don't believe we will ever succeed from the state level.

DR. MILLER.—Mr. Chairman, in reply to the question, may I give a local example in Colorado? This concerns measles in cattle. We had many cases of measles in the feedlots, due primarily to the Mexican laborers and German prisoners of war we used in our fields. They contaminated the feed of the cattle, and as a result we had many cases of measles.

Our livestock sanitary officials were not particularly concerned about this situation. They didn't know anything about it. The veterinary medical association of which I am a member carried on an educational campaign at our own expense. Our state public health and the livestock sanitary officials were not concerned at all. The association sent hundreds of letters to farmers telling them how they could avoid infecting their cattle. Through the Labor Department and other means, we disseminated this knowledge. I say that it is the lack of interest of the sanitary officials in this matter that is responsible for the nonreporting of these diseases.

MODERATOR BURNEY.—The next question: How can the local practising veterinarian get the health department to do something about rabies?

DR. STEELE.—Dr. Bashey of Cincinnati can tell us of an interesting ordinance which I believe was just put into effect. Is he here? Perhaps Dr. Sisick of New York will tell us about his experience with rabies in his state.

DR. SISICK.—In my own case, it was a question of opening my mouth and putting my foot in it, *i.e.*, criticizing in a constructive way, outlining the methods, and then saying, "Let's see you do it; take it away."

You must start with legislation you have and work out ways and means of accomplishing your objective. No one can give a pattern that is going to work in every municipality in every state. It is a question of cutting the suit to fit the man. We have tried to do it by broadening the base, and that is not the way Dr. Bashey has indicated it was done in Cincinnati.

We did obtain mass vaccination on a voluntary basis by means of an educational campaign and by bringing into the picture veterinarians, health officers, dog owners, and agencies which are charged by law with controls. These people frequently have regulations on the statute books but not the machinery to make it function, and that takes an educational program. Those are the essentials of the program we used.

DR. STEELE.—Dr. Tierkel, have you any comments about how it was done in Alabama? How have they inaugurated their program?

DR. TIERKEL.—You mean how the practitioner can inaugurate a program? Asking the practitioner to inaugurate the program is not a very sound idea, considering the control procedure of diseases like rabies. I think a properly authorized veterinarian can do a great deal more than the average practitioner. The practitioner does the work for us and we need properly authorized personnel to direct the program and the educational campaign; get the veterinarians together and do the mass immunization of dogs; set up clinics; impress the public with the seriousness of the disease; and get the stray dog control program under way.

As Dr. Sisick pointed out, it is a matter of organizing and having properly authorized people at the local level and coördination at the state level. Otherwise, a lot of time is wasted by allowing one municipality to follow one procedure and a neighboring municipality to use an entirely different method of control. One will conflict with the other, and an ineffective program is the result.

We can't go about this thing haphazardly. Where the outbreak is sporadic and epidemic, we must have well-organized uniform control patterns.

DR. STEELE.—Does anyone else wish to comment from the practitioner's point of view?

MEMBER (Mich.).—The practitioner can't do very much. I was in that situation about three years ago. For about the last seven years, I had not less than 20 cases of rabies annually and I was only one of several practitioners. None were in Detroit. We are on the outskirts of Detroit, the dumping ground for all the unwanted dogs of the city. Towns to the east and west had good dog ordinances and control programs, but the township I was in had no control program. To the south was a town of 7,000 or 8,000, near Willow Run and the other warworn villages. In that section, hundreds of people, particularly from the South, brought their dogs with them. I am quite sure that the Pasteur Institute of the University of Michigan does not report the positive cases of rabies to the state veterinarian. I reported all of mine, but I was never particularly encouraged. One year I reported about 25 cases, and some months later, the report on the number of cases in Michigan was 25. I have reported at least 85 cases. Most of them came from the counties south of me.

I talked to the city fathers, but Wayne has no dog ordinance. The sheriff, according to the state laws, is held responsible, but the law says no one is responsible if they are 30 miles from the city that has over 500,000 in population, so who is responsible? The sheriff passes the buck to the Board of Supervisors, who pass it on to the townships, which pass it to anybody else they can.

Now, my own township has an ordinance. Three of them around there have not. I don't feel comfortable with 3 or 4 cases of rabies in my hospital.

DR. TIERKEL.—I am glad the doctor brought that up. That is typical of what will happen when there is no authorized responsibility delegated from the state level.

We are finding in Alabama and Georgia that probably the best way of organizing rabies control on a local level is the appointment by the state board of health of a responsible rabies inspector who is an authorized veterinarian in the county. We have one rabies inspector for each of the 67 counties in Alabama. Unfortunately, not every county has a veterinarian, so we have about half a dozen laymen who are serving as rabies inspectors in counties which have no veterinarians.

These men are responsible to the state board of health, and their authority is delegated to them by their county commissions. The pounds are financed by local county funds and by dog licensing, which is not extensive. We are trying to get it enacted as uniformly as possible throughout the state, but the local control activities are financed from local funds and from payment of fees for the immunization of the dogs.

Each year, a new list of rabies inspectors from each county is prepared by the state board of health. Generally, they are recommended by the state veterinarian and turned over to the state board of health for approval so that each one is authorized and responsible for the rabies control activities in his county. In that way, we can get a pretty accurate picture of how control activities are going throughout the state.

We would like to see similar efforts in a few more states. Georgia has just begun this year. Unfortunately, Georgia has 159 counties which makes it more difficult but, sooner or later, they will change the state health law so that several counties will be incorporated into one health unit and smoother administration will result. That will help our rabies control program and our other programs a great deal.

MODERATOR BURNEY.—Dr. Steele, is Q fever present in animals other than cattle?

DR. STEELE.—Q fever, as most of you people read in the veterinary journals this past year, has broken out in the United States in three epidemics in three different parts of the country. The first outbreak was in Texas in March, 1946, the second in Chicago in July, 1946, and the latest one was in May, 1947, in Artesia, Calif. The disease as it has occurred in man was similar to virus pneumonia. The strange thing about it was that the cattle thought to have been the source of the disease in man had no symptoms.

I just obtained information from Dr. Hurt of Los Angeles County that a number of goats died from the disease in the Artesia outbreak

The pathology has not been worked out definitely, but will be soon, we believe. This is the first indication that this disease can cause serious mortality in animals.

At the time these epidemics occurred, the U. S. Public Health Service, both through the National Institute of Health and the Hamilton laboratory, had been investigating this disease in the field. The disease has been found in many arthropods, various types of ticks in the West, and as far east as the Missouri River. Recently, Dr. Parker, director of the Hamilton research station, has been conducting a survey on dog serums throughout the United States, and he has found indications that the disease is present in dogs. He has not recovered the organism, but the dogs have a high agglutination titer.

The disease has been found also in wild animals such as mink in the Northwest, foxes, and opossums; it also has been found in sheep in the West. In the future, we may find this disease in practically every animal on the western plains and in the East as well.

Following the artesia outbreak, and subsidence of the trouble in the cattle that reacted, we thought it was sufficient evidence that the infection was confined to that area or eradicated. Through coöperation with Dr. Bluchner, M.D., of the Livestock Sanitary Board, we received a number of serum samples and we found that 60 per cent of the animals tested were having reactions that were running from 1:125 to 1:150. None of the reactors at the time of the outbreak ran over 1:100.

The disease is curious in that the symptoms lead one to suspect that the animals may have had this disease a long time. It does not take an acute form. Why we haven't stumbled on it before is bewildering.

MODERATOR BURNEY.—Are there any comments from the floor, or further questions? If not, we will proceed to the last question: What can be done to improve food sanitation in small town dairies and slaughterhouses?

I might start out on that and let Dr. Bryan and Dr. Miller finish. We have had a lot of interest, in many places, on the sanitation in food establishments such as restaurants, hotels, etc. We have had a number of food outbreaks as other states have had, and many of our restaurants, dairies, and slaughterhouses are in poor condition.

Some of the members of our legislature indicated an interest in passing a state law which would require that every food-handling establishment in the state be licensed by the state board of health. We discouraged such legislation because we feel that is a local problem that cannot be handled efficiently and well by a state organization, just as we feel that a dairy grading program is something for a local organization to handle and that the public health problem, whether school health, school sanitation, or maternal health, are all local problems. So in Indiana at least, our job as a state agency is to help the community become aware of the great problems we have and to help them pass the proper kind of ordinances. Outside of the cities, of course, the counties will have to depend upon the county sanitary people. We will help to train their personnel. We will send our consultants to check on the persons selected to do the job but, in the final analysis, such a job can best be done by local people under local direction.

DR. MILLER.—I might speak again about our local conditions. We have our county health unit which inspects dairies, markets, and restaurants. They do not have supervision of the local slaughterhouses.

Where there is no local county health unit, it is difficult to know just how to proceed with inspection on a statewide basis or a countywide basis.

DR. BRYAN.—I have nothing to add to that. However, it requires tact. A problem that is not unusual: A community will hire sanitarians and maintain a health department, charging them with the inspection of restaurants, creameries, etc., and if a restaurant is found unsatisfactory and the owner resists and does not coöperate, it is then necessary to hail him into court.

Now, the public is with the Public Health Department up to that point, but as soon as this man appears in court, public opinion shifts to the operator, who then becomes the oppressed, and then things have to be settled out of court, and of course, prestige of the whole setup fails. This is merely an observation of a thing we see occurring right along.

If we have the proper legislation, and the people learn the right tactics through educational means, much can be done, knowing that in some instances something stiffer must be used.

MODERATOR BURNEY.—One other problem we have found is that the restaurants with the white tablecloths and the most chromium are the worst offenders. The public doesn't see the kitchen and how the food is stored and they can't understand why such a restaurant is being penalized while another restaurant down the street that has checked tablecloths or none at all is approved.

We have in the audience Colonel Dildine, formerly of the Army Veterinary Corps, who has been very much interested in veterinary public health. I wonder if he would have something to add to this?

COL. S. C. DILDINE (Canal Winchester, Ohio).—I have a question for the panel. During yesterday's session there was some confusion in my mind, and I think in others, as to just how a veterinarian should and could be used most efficiently in the board of health or in the health department. In many health depart-

ments I have seen, the veterinarian has worked under a laborer. I can't believe that is the best way to use the services or time of a trained veterinarian, so I would like to ask the panel how they think a veterinarian can best be used in a board of health to insure that dairy farms and dairy plants are adequately inspected?

MODERATOR BURNEY.—Dr. Bryan, would you answer that?

DR. BRYAN.—I don't have the answer. I believe Colonel Dildine has presented here a proposition that is well worth thinking about. I have seen health departments where the veterinarian works under a layman and others where the veterinarian is supervisor, and is consulted by the layman under him. Very definitely. I am of the opinion that it is only under the most unique setups, with compatible personalities, that the veterinarian can work under the layman. Generally speaking, that arrangement doesn't work out well. On the other hand, where people of a certain type are involved, it apparently makes little difference. But I would certainly favor a setup where the talents, background, and the abilities of the veterinarian are utilized much more fully.

Just how that can be done, I am not sure. If an M.D. were director of a health department, possibly consideration would be given to the veterinarian. He, as an assistant director, might bring about a balance that would work to the mutual benefit of all.

MODERATOR BURNEY.—I am wondering if, as we have more veterinarians in our public health agencies, both state and local, that situation will not tend to correct itself? For example, in 1910, sanitary engineers in our state worked under the Food and Drug Department. They were a subordinate section, not even a division. Now, they have their own division and we have around 30 sanitary engineers.

We had expected that when we were able to secure a sufficient number of veterinarians, they would take over certain duties for which they are well trained. We gave consideration to the establishment of a division of veterinary medicine which would embrace all the fields of our experience, such as food, restaurants, slaughterhouses, brucellosis, and other diseases.

MEMBER.—Dr. Burney says perhaps the food and milk inspection and the sanitation angle may be straightened out. I believe, as more sanitary engineers get into the health department, as they are (and they have their place) we will find that the sanitary engineer will be more clearly in a position to handle food inspection from the administrative point of view, and the veterinarian will retire to the state level or local level and will be classified as an assistant to the sanitary engineer. The American Public Health Association is on the verge of fostering that idea now. I still don't feel that we should be placed in a subordinate position to the profession of sanitary engineers.

DR. TIERKEL.—I would like to point out that we in the veterinary division of the public health service have been experiencing a tendency towards expanding from the restricted operations on a local and state level of food, meat, and milk hygiene, to epidemiologic work in the diseases that are transmissible from animal to man. We notice the work is being done on a survey scale now, sponsored by the U. S. Public Health Service. We hope it won't be long before every state takes up the problem and creates, as Dr. Burney has suggested, a veterinary public health division, section, or bureau somewhere in the control programs at state level.

I believe Dr. Burney is correct in assuming the situation will straighten itself out. When the state health department seeks to train veterinary personnel, it will seek men not only interested, trained, and qualified to do the inspection and dairy work, but also men who know how to handle the peculiar animal disease problems which complicate their health setup, such as brucellosis, rabies and other diseases prevalent in many states.

It is a part of the public health service program to urge the employment of such veterinary public health officials in each state—a man on a consultant basis. If it is not feasible to set up a separate section, the veterinarian can be available throughout the administrative setup of the state, from the sanitary engineering division to the epidemiology division. His training and qualifications could be utilized best that way.

COLONEL DILDINE.—I don't think the state is a low enough level. In the states I have worked with, the state doesn't have much influence in a lot of the larger municipalities, counties, and smaller districts, so I think the suggestion of having the veterinary division or section in the health department must be carried down to a lower level. There isn't enough personnel, many of the states are too large, the veterinarian has too much work to do, and some of the cities will highly resent the state board of health participating in their city. Therefore, I think that the veterinarian must be carried down to the smaller units below the state level if he is to be efficient.

DR. STEELE.—We speak about these conditions working their way out. The only way they can do that is by dynamic action, having the other professions understand our problems, and establishing controls. In the epidemiologic work being done in the United States at this time—brucellosis, rabies, and other such diseases—the goal is to determine how we are going to control the diseases. Many diseases are transmitted through food products, and that in itself will demonstrate the necessity of having veterinary-trained personnel on the job. Public health veterinarians then will have their place in the sun.

But, there are two other problems in regard to the veterinarian and public health. Few communities have the funds to employ a competent veterinarian; and, we don't have enough veterinarians to go around if the communities did have the funds.

DR. VAUGHN.—I heartily concur with what was said up to a certain point. Some time ago, the American Society of Civil Engineers, from which the sanitary engineers emanate, published a list of eight items which they believed were under the direct jurisdiction of the sanitary engineers. Of those eight items, I will mention two: (1) They listed the supervision and control of the milk supply from production on through to the consumer. (2) They listed diseases transmitted from animals to human beings and some reference to their related parasitic infestations. Now, that is an infringement on veterinary medicine. I don't know the answer to this problem.

What is environmental health? I would like to know what it is. We live in our environment, so everything we do becomes a part of our environment. Where do we stop?

Yesterday the question was asked, "How do you know when to stop a layman from infringing on veterinary problems?" I ask the same question now. How do you know when to stop the sanitary engineer from infringing on our problems? They are specifically trained in water supply, sewage disposal, etc. Those are engineering problems. We would be extremely foolish to try to serve in that capacity, but on the other hand, they don't understand why many things aren't under their jurisdiction. I will even concede, short-time, high-temperature pasteurizing equipment becomes a mechanical problem we should stay away from, but they won't even concede that milk production is, to a greater or lesser extent, a veterinary problem.

COLONEL DILDINE.—We haven't had enough trained veterinarians to serve in all the smaller municipalities. We certainly should have enough to serve on state boards of health and in the larger cities, and it would give veterinarians who are so employed a lot of moral support if this section would go on record as recommending that the veterinarian should be a direct assistant to the physician who is rightfully at the head of the board, and that all problems of milk inspection, dairy inspection, and diseases transmissible from animals to man and vice versa, should be under the veterinarian's direct control.

DR. VAUGHN.—In other words, you want to make that a staff position?

COLONEL DILDINE.—Yes, and get the veterinarian rated as technical adviser, the same as we are in the army; a technical adviser to the physician who is the rightful head of the health department. Where disease is definitely of animal origin the work should be under the veterinarian who is best able to deal with this kind of problem.

DR. VAUGHN.—Then the American Public Health Association and in some cases, the U. S. Public Health Service, in making surveys of local health units and of state health units, have set up in their organization charts two major subsections, the medical and the sanitary, and almost invariably the medical section is headed up by a physician and the sanitary section by the sanitary engineer. The veterinarian will be found on a line below that, if present at all. I believe veterinary activity should be set up as a separate section or as a sub-branch of a medical section and kept away from the sanitary section entirely.

COLONEL DILDINE.—That is just the thing I am talking about. I don't want to see the veterinarian sit quietly in the back of the room, while the college graduate sanitary engineer sits up in the front and tells you, "This is the way the thing should be done." I want to see the veterinarian in his rightful place on each board.

DR. A. ZEISSIG (Ithaca, N. Y.).—I agree with the last two gentlemen. I think the medical profession is coming to appreciate the veterinarian more and more. If you go back in the history of the first public health setup, the first man in it was a physician. The next man to come in was the engineer. In many cases, those men have done good work, but we appreciate, and I think many others appreciate, there are changes to be made if the system is to be improved. I seriously doubt if they will be made by one fell swoop. You may sell it as a matter of organization, but I think it will eventually be sold by individuals, *i.e.*, by some of us demonstrating what veterinarians can do.

I have seen several instances of that sort, both on the state and county levels, and county health commissioners recognize it. Maybe the thing to do is to work at it both ways; those of us who are engaged in it must try to do a conscientious job of rendering service in that way. To show that you have done something is the most successful way to sell it.

DR. BAUM.—I want to reëmphasize the statement that sanitary slaughterhouses should be regulated at the county level. The fruits of Dr. Steele's labors in Ohio have shown that it can be done.

We have passed regulations in my county for slaughterhouse sanitation at the county level and two plants were completed this week which have only a few cows per day capacity, but they are within the regulations of the sanitary rules which Dr. Steele developed with the health department and recommended for local county usage. I wish some of you could see the appearance of these two small plants.

MODERATOR BURNEY.—We must end the discussion. I would like to thank the members of the panel for participating, and I know that I, as a public health administrator, got a great deal out of it.

Changes in Control Program of Mexican Foot-and-Mouth Disease

Since the last summary on the foot-and-mouth disease situation in Mexico was published in the JOURNAL (Sept. 1947, pp. 182-183 and Nov., pp. 355-362), disturbing developments have occurred. Resistance to the eradication campaign being jointly waged by the Mexican and United States governments has increased considerably and in some areas had become so bitter that a Mexican veterinarian and a seven-soldier escort were murdered, and sanitary squads were being threatened with violence in several states within the primary and secondary zones (*See* map, p. 149, March, 1947, JOURNAL). The opposition to the slaughter and quarantine measures had reached such a serious state by late November that the U. S. Department of Agriculture deemed it necessary to announce the following changes in the program in a release dated November 26:

The U. S. Department of Agriculture announced today that it has accepted a proposal by Mexican officials, through the Mexican-United States Commission for the Eradication of the Foot-and-Mouth Disease, to change the present foot-and-mouth disease program in Mexico. The plan of operation, as revised from the present slaughter program, will include vaccination, continuation of quarantine, and, when necessary, slaughter of infected and exposed animals.

The proposal to change the program was prompted by the fact that it is now apparent that the ultimate destruction of the great number of susceptible animals in the infected zone would mean a tremendous economic and social impact upon Mexico.

At the request of the Mexican Government, the United States coöperates actively in the campaign in that country. Members of a large

—USDA Photo.

The "sanitary rifle"—occasionally supplemented by the "sanitary pistol"—dispatches the diseased or exposed animals after they have been appraised.

United States technical staff are working with their Mexican colleagues. The representatives of the two countries work jointly at all times in carrying out the campaign, and the combined efforts have kept the disease thus far within the general quarantine limits. However, because of the many inherent adverse conditions in the infected area, it has not been possible to achieve fully satisfactory results under the present slaughter program.

Officials of the two countries are now endeavoring to develop the best possible alternative plan for checking the spread of the disease and keeping it within the present quarantine area. Vaccines have not been authorized previously as a control measure in Mexico, because their use has not been regarded as favorable to rapid, complete eradication of the infection. The official consultations now in progress, however, include reconsideration of this method, together with continuation of quarantines and any necessary slaughter of infected and exposed animals.

The necessary changes in the program have been fully discussed with members of the Department of Agriculture's foot-and-mouth disease advisory committee, which is composed of representative members of the United States livestock industry.

This changed outlook brought prompt repercussions on this side of the border, particularly among livestock owners and sanitary officials. At a joint meeting in Chicago early in December, representatives of several livestock and breed associations voiced grave concern and sent a delegation to Washington to confer with government officials and Congressional committees who have been watching the foot-and-mouth disease campaign in Mexico closely. (*See* Nov., 1947, JOURNAL). Meanwhile, BAI Chief, Dr. B. T. Simms, was quoted in the December 8 issue of *Time* as saying: "We've got to push it back or it will push us back. Foot-and-mouth disease does not play a tie game."

New Terminology for Vitamins

Owing to the increasingly unsatisfactory alphabetic names for vitamins and their confusing fractions, a revised terminology is proposed by C. I. Reed, University of Illinois Professional Colleges (*Science, 106,* Sept. 5, 1947: 226). The new names are to be based upon *(a)* chemical composition, *(b)* physiological rather than therapeutic action, and are to be distinctive but nonspecific. For example, *accarene* for vitamin A, *ossiferol* for vitamin D_2, rather than *calciferol,* and *sedesterol* for vitamin D_3. *Ascorbic* acid is taboo because it refers to a state of deficiency rather than its chemical composition. Also, such tongue twisters as *axerophytol* for vitamin A are objectionable.

Bovine Mastitis Following Foot-and-Mouth Disease

Experiences in Palestine (*Refuah Vet.,* July, 1947) showed that a dramatic rise in the incidence of bovine mastitis can be expected in the wake of a foot-and-mouth disease outbreak. In over 3,200 cows in 42 settlements surveyed before and after a recent outbreak, the number of mastitis-infected animals was found to be nearly doubled, and the number of infected quarters was more than doubled. The exact figures were 637 cases before and 1,125 after the foot-and-mouth disease epizoötic, and the number of infected quarters rose from 983 to 2,025.

Dressed Poultry Avaunt!

"I told you so" is boasting even if true but where the situation warrants, it can be translated into emphasis. Three years ago, the JOURNAL, guided by the Committee on Food Hygiene, recommended that the marketing of so-called New York dressed poultry ought to be discontinued on hygienic grounds, and comprehensive plans for its discontinuance were published (JOURNAL, Apr., 1944: 206-207, 208-216; March, 1945: 145-152). Quoting *Egg and Poultry Magazine,* November, 1947:

> We seem to be starting a new era in poultry marketing. Instead of being sold with the head and feet attached and the offal still in the body cavity, before long most western chickens and turkeys will be eviscerated and sold ready for use in attractive containers, either fresh or frozen. . . . New grades and better methods of grading will be developed and inspection of all poultry processing plants will be required.

Otherwise told, the critical doctrines of modern veterinary medicine in respect to inspection of poultry at the time of slaughter, the trend predicted in the articles cited above, is rapidly coming to pass.

About 20 per cent of the hens of laying age in the United States die before their egg production pays for the cost of rearing. —*USDA.*

Poultry Inspection as Part of the Public Health Program

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THE HISTORY of meat hygiene and especially meat inspection, which is closely connected with the development of man's civilization, can be only briefly covered here in an effort to show its general development.

The earliest records concerning meat inspection date back to the Egyptian food edicts. These edicts antedated the establishment of the Mosaic food laws of the Israelites and prescribed that all animals and fowl be healthy and free from blemish at the time of slaughter. It is interesting to note that, as these laws concerning meat food products were amplified, no differentiation between the meat of fowls and animals was made. The Mohammedan and Kosher food regulations of today require the same standards of health for avian and mammalian species.

During the first years of the twentieth century, publicity given the insanitary, loathsome practices of the slaughterhouse operators in the United States created such public revulsion against meat products that the packers, public health officials, and public demanded the establishment of a Federal Meat Inspection Service. An act was provided covering mammalian food products only, as at that time, poultry meat was marketed largely in the live state and the purchaser generally had an opportunity to see the bird both before and after it was slaughtered. There were no large poultry slaughter operations where the viscera were removed from the carcasses, and no provision for poultry inspection was made. In the past forty years, however, the great expansion of the poultry industry, the development of the modern poultry packing plant, and changes in the methods of marketing have altered this picture completely. Probably not 1 bird in 100 consumed in the United States today is seen in the live state by the ultimate consumer.

The practice of freezing poultry immediately after it is slaughtered and plucked, and of marketing it in the undrawn state, has been followed since the development of the modern poultry slaughtering plant. This practice has marked disadvantages, namely, the inability of the consumer to judge the health of the carcass, the impossibility of an adequate postmortem examination, the contamination of butcher's blocks, or the kitchen, with the viscera, and the loss of quality due to the absorption of fecal odors and flavors by the edible meat. Up to 1928, the only drawn poultry available for home consumption which was distributed on any considerable scale was canned. Keen competition in the poultry marketing field has stimulated the packer to use every method which results in production cost savings. Some of these methods are not consistent with sound, sanitary concepts and public health considerations. The development of the marketing of the drawn carcasses and the conditions in the poultry canning plants stimulated the industry and public health officials to search for corrective measures.

Poultry, to be fit for consumption, must have been derived from healthy birds, prepared under conditions which assure freedom from contamination. Furthermore, the edible portions must be separated from the inedible portions in such a way as to assure that the meat which is to be used for human food has been handled in a cleanly manner throughout.

In order to provide for an adequate poultry inspection service, the Secretary of Agriculture, at the request of some members of the industry and public health officials, issued regulations[1] covering the inspection of dressed poultry. Sanitary and postmortem instructions[2,3] were issued under these regulations. This service is provided on a voluntary basis, and all costs incident thereto are met by the plants receiving inspection. The very real dangers to the public health from diseased and otherwise unfit poultry have not been fully realized by many in the veterinary profession.

Note should be taken of the compilation of the Sanitary Engineering Division, Milk and Food Section of the U. S. Public Health Service,[4] in which are itemized the disease outbreaks conveyed through foods other

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than milk and milk products in the United States in 1945, as reported by state and territorial health officials. Two hundred and thirty-two cases of food poisoning other than botulism and chemical poisoning, affecting 10,213 people, are reported in this compilation. Of these 232 cases, 47 are reported to be associated with poultry meat products. These 47 cases affected 1,496 people, with 1 fatality.

It is generally understood that, most commonly, food poisoning cases are not reported to the authorities. This is particularly true of food poisoning outbreaks where the family has been on a picnic and eaten chicken sandwiches, chicken salad, etc. Emphasis must also be placed on the importance of the contamination of the kitchen by the introduction of diseased birds and subsequent contamination of foods following this introduction. As epidemiologists investigate food poisoning outbreaks more extensively, in all probability the rôle of poultry pathogens, also pathogenic for man, will be increasingly emphasized.

Pullorum disease, the most serious poultry disease in the United States, has been carefully and extensively studied for the past thirty-seven years by innumerable workers. In spite of this most comprehensive research, it was not realized until recently that this organism can also be a human pathogen.[5, 6]

The recent reports of Mitchell and coworkers[7, 8] of an outbreak of food poisoning affecting 423 persons, 172 requiring hospitalization, highlights the fact that poultry pathogens, previously considered pathogenic only for birds, are potentially dangerous to the human family.

The causative organisms of diseases common to man and fowl are killed by thorough cooking. For this reason many of these infections are infrequently observed in man. We cannot overlook the fact, however, that the carcasses of diseased birds often contain myriads of pathogenic organisms which are introduced into the kitchen with the carcasses; and knives, sinks, pans, hands, towels, etc. are contaminated by these disease germs. In preparing chicken salad, cold chicken sandwiches, etc., these organisms may again be introduced into the edible product, and cases of food poisoning or infection are the result. Frequent cases of food poisoning from turkey dinners are due to the introduction of these pathogenic organisms from the birds into the dressing. The great thickness of the dressing sometimes does not allow adequate heat penetration to insure sterilization of the central mass, and infection of the consumers results.

Anatomic Differences in Birds and Mammals

Greater concentration of pathogenic organisms in the flesh and other edible parts frequently occurs in birds because of the following anatomic differences between mammals and birds.

In mammals the function of lymph glands is to filter out and localize infection. As lymph glands are absent in chickens, and only partially developed in water fowl, the diseases of birds are usually characterized by an initial septicemia.

The other anatomic difference between birds and mammals that makes possible greater concentrations of pathogens in the eviscerated carcass of fowl is the presence of air sacs in birds and their absence in mammals. McLeod[9] points out that these air sacs connect directly with primary and secondary bronchi in the lungs and with the hollow bones. They are located in the thoracic and abdominal cavities and extend into the intermuscular spaces of the shoulders. Inflammatory diseases of the lungs are often spread throughout the air sacs as localized inflammations. Such localizations are often seen in aspergillosis, infectious bronchitis, Newcastle disease, and the paratyphoid pneumonias.

Diseases Common to Man and Fowl

The following infectious diseases are now known to affect both man and fowl and, though direct transmission to man has not been shown in all cases, public health officials, epidemiologists, and epizoötiologists are becoming more and more convinced that birds are the reservoirs of many diseases affecting man and other mammals:

Aspergillosis.—Aspergillosis, caused by *Aspergillus fumigatus,* has been observed in many birds and mammals. Frequent refference is made to the relationship of the disease in man to occupation, particularly in the so-called *graveurs des pigeon* (pigeon feeders') disease.[10, 11, 12, 13] Diagnosis is readily made in advanced cases. The lungs and air sacs are the principal sites of infection, but the process may extend into the peritoneal cavity or into the air passages

of the bones. The kidneys, liver, and spleen may be affected by direct contact from the air sacs. Yellow, semi-liquid, or caseated masses in the air sacs and lungs, with button-like ulcers in the serous membranes, are common. In the early stages these ulcers appear as round, yellowish white masses attached to the membrane. In advanced cases a greenish mold turf may be seen over the surfaces of the infected areas and in the convex depressions of the ulcers, especially in the air sacs.[15]

Bullis[14] and Hinshaw[15] call attention to the public health significance of this disease.

Achorion schoenleini and *Achorion gallinarum* are two fungus organisms which cause favus in man and birds.[15] Favus, also known as honeycomb ringworm or crusted ringworm in man, is a disease of birds not infrequently observed on the inspection line. The disease in domestic poultry usually involves the comb, wattles, and unfeathered skin around the eyes. Minute, moldlike, grayish white scutula appear; as the process develops, these coalesce and cover practically all the comb, wattles, etc. Subsequently, the feathered skin of the neck, back, and other parts of the body is attacked. When this occurs, the feathers of the affected region become surrounded by a thick, scaly cutulum and become loose in the follicles and drop out.

Thrush.—Monilia albicans, a yeastlike fungus, is the cause of a rather common form of thrush in young children[16] as well as thrush in birds. The lesions in birds occur most frequently in the crop and consist of a thickening of the mucosa with whitish, circular, raised ulcerous formations, the surfaces of which then scale off. Pseudomembranous patches and easily removed necrotic material over the mucosa are not uncommon.

Wickerman[17] and Jungherr[18] made extensive studies of *M. albicans* cultures from chickens, turkeys, and human beings and could not differentiate them in any way.

Ornithosis.—A virus disease of birds and man described by Ritter in Switzerland in 1879 was first discovered in parrots and called parrot fever or psittacosis. As research revealed that other birds than the parrot family also harbored an almost identical virus, it was given the name ornithosis in other species. Meyer and Eddie[19] describe a case of ornithosis in a 54-year old woman, the wife of a poultry farmer, who had no contact with birds other than chickens. Examination of the flock resulted in the recovery of the ornithosis virus from the birds. Many cases of the disease are reported in human beings contacted from pigeons.

The postmortem lesions in birds as described by Meyer[20] are as follows:

> The acute stage: there is always wasting of the pectoral muscles. The skin may be covered with an erythematous rash, macules from 2 to 4 mm. in diameter being scattered uniformly over the body and legs and the lesions being from 1 to 2 cm. apart. Mucous plugs are present in the nasal openings. Internally, a profuse semipurulent coating may be adherent to the inner lining of the sternum. A massive fibrinous exudate or merely an effusion with fibrinous flakes may cover the heart and fill the pericardial sac. Similar exudations or plastic deposits may be present over the capsule of the liver. The liver always is swollen and heavy, with rounded edges, slightly pale saffron to ocher-colored, finely mottled with shades of greenish brown or merely patchily discolored. Occasionally (in about 10%), the organ is studded with fresh, small and large areas of necrosis or infarction surrounded by hemorrhagic zones. The spleen as a rule is enlarged, occasionally covered with inflammatory lymph, dark in color, and sometimes spotted with fine necrosis. The kidneys are swollen, light grayish in color, and quite soft and friable. The intestinal serosa is injected, and the mucosa is hyperemic. Only in very rare instances are lesions demonstrable in the lungs. A few red, flabby areas of consolidation may be present in the lower portions of one or both lobes of the lungs.
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> Chronic latent stage: Visibly healthy, well-nourished parrots or shell parakeets examined in the course of surveys may yield essentially negative autopsy findings with the exception of slightly or definitely enlarged spleens. Some birds with enlarged spleens likewise may show a slight thickening of the walls of the air sac and scars of healed necrosis in the liver with peritoneal adhesions.

Cox's[21] recent review of the literature should be referred to for further information.

Infectious Equine Encephalomyelitis.—Primarily a disease of equine animals, man and pheasants are frequently affected during epizoötics of this disease in horses.[22, 23] Many birds have been shown to harbor the virus and are susceptible to infection. It is generally felt that birds serve as the chief reservoir of this disease. Tyzzer and coworkers[24] inoculated very young Rhode Island Red chickens with the pheasant

strain of eastern equine encephalomyelitis virus. Some died in two to four days and showed pathologic changes in the brain, heart, gizzard musculature, and sometimes in the liver. Usually, however, mature domestic chickens show no lesions or symptoms. Giltner's[25] and Kelser's[26] reviews of the literature should be consulted.

Newcastle Disease.—Though primarily a disease of birds,[27] several recent reports in the literature list this disease as an infection in man. Burnet[28] first described this disease in man as a conjunctivitis which developed in a laboratory worker. In the chapter on evolutionary and ecologic aspects of some human virus diseases in his book, "Virus as Organism," he discusses the great possibility of evolutionary changes of the respiratory virus diseases of birds which may render them pathogenic for man. Shimkin[29] reports conjunctival hemorrhage due to an infection of Newcastle virus in man — laboratory and contact infection. Yatom[30] reports an epidemic outbreak in Egypt, of 17 human cases resulting from contact with fowl affected with Newcastle disease. Anderson[31] also reports this disease in man. The only reported Newcastle infections in man in the United States have been accidental laboratory infections.

In this country the disease has caused a generally lower mortality than that (80 to 100%) reported elsewhere, but there is no assurance that the disease here will so continue, or that its host specificity will remain unchanged.

Postmortem examination seldom reveals pathognomonic changes. A slight catarrh of the trachea and bronchi, with mild exudation, is commonly present. Cloudiness and yellowish thickening of the air sacs may be a prominent feature. Hemorrhages of the mucous membrane of the proventriculus have been seen in the more acute forms. A small, pale spleen has been described as characteristic of the disease in this country.

Listerellosis. — Avian listerellosis is caused by the bacterium, *Listerella monocytogenes*, which also causes disease in man and other animals. In the reports of this disease in chickens,[32, 33, 34, 35] no reference is made to central nervous disturbance, which characterizes the disease in man and other mammals.

Postmortem examination shows massive necrosis of the myocardium, pericarditis, generalized edema, necrotic foci of the liver, and splenic hyperemia. This disease was not recognized until 1926 when Murray, Webb, and Swann[36] reported it in England.

Swine Erysipelas Infection.—The occurrence of a disease in birds caused by the organism *Erysipelothrix rhusiopathiae* has been reported with increasing frequency, and in some outbreaks heavy losses have occurred, particularly in young turkeys and ducks.[37, 38, 39, 40, 41] The condition is usually acute or subacute in character and it assumes importance epizoötiologically and epidemiologically because pigs, horses, cattle, and sheep, as well as human beings, are susceptible to the infection. Fish, though not susceptible, often carry the organism on their slime. At autopsy numerous lesions are observed, but these may vary from case to case and are not usually considered pathognomonic. In most cases, petechial and punctate hemorrhages are present in the pectoral, thoracic, and abdominal muscles, over the ribs, and occasionally in the region of the thigh. Hemorrhages may also involve the pericardium, epicardium, pleura, and peritoneum. Thick mucus is usually found in the nasal cavity. The liver is regularly involved, being hypertrophic, engorged, and friable; mottling may be noted in some cases. Inflammation of the duodenum regularly occurs, and in some cases the lower intestine is similarly involved. The spleen is usually friable and congested. The lungs and kidneys occasionally, but not constantly, show congestion. Swelling of the snood when it is present seems pathognomonic. Cyanosis is usually present. Erysipeloid lesions may appear on the face, involving the major portion of the eyelids and the area posterior to them.

Tularemia. — The germ that causes tularemia, *Pasteurella tularensis*, was discovered within the past forty-five years by workers in the U. S. Public Health Service.[42] First found in Tulare County, California, the disease has since been reported in all parts of the United States and in foreign countries. Though tularemia is usually a disease of wild animals and birds,[43, 44] domestic birds are susceptible and we must be on the lookout for such cases. Postmortem examination reveals hyperemia of the spleen, which is studded with minute necrotic foci. The necrosis occurs both in the follicles and in the pulp. There is hepatic congestion with multiple small areas of degeneration. These are points of coagulation necrosis where bacterial emboli

are present. Experimental animal susceptibility to *P. tularensis* isolated from rabbits and birds[45] indicate that the strains isolated from rabbits are more virulent than those from birds.

Pseudotuberculosis.—The organism *Pasteurella pseudotuberculosis* causes tuberculosis-like lesions in rodents, man, and birds.[46, 47] The disease is characterized by an acute septicemia of short duration, followed by a chronic focal infection which gives rise to tubercular lesions in various organs. All cases diagnosed in man have proved fatal. Extensive outbreaks of pseudotuberculosis in turkeys has been reported by Rosenwald and Dickinson in Oregon.[48] Postmortem examination of acute cases reveals hypertrophy of the spleen and hemorrhagic enteritis. Subacute or chronic cases show gross enlargement of the liver, spleen, kidneys, and lungs. Yellowish white foci of the size of a millet seed appear in these organs, as well as the breast muscles and mesentery. Ascites is often a feature of the disease.

Brucellosis.—Although natural infection of fowl by Brucella undoubtedly occurs, the disease is apparently of little economic importance in the United States.[49] Emmel and Huddleson[50, 51, 52] fed naturally infected milk, portions of an aborted fetus, and culture to fowl and produced infection. The symptoms of the disease are loss of production, progressive anemia, diarrhea, and emaciation. The birds become very weak and often show paralysis. The spleen is first enlarged, later shrunken; the liver is pale and mottled, with many brownish or gray foci, and at death is friable and pale; the kidneys are degenerated and pale; the ovary is non-functional and degenerated, with the ova becoming flaccid and dirty in color. There is a necrotic enteritis, with irregular, elevated areas of cell infiltration in the duodenum. Stafseth's[49] review of the literature concludes with this summation, "Since birds can become infected with Brucella and may thus serve as agents of transmission of this disease, not only to other birds but to mammals as well, one should take steps to prevent fowls from being in contact with infected animals." The Russian workers report that brucellosis is a major poultry disease problem in Russia, and there is no reason to believe that its virulence for birds may not increase in this country. In a recent investigation by Berman[53] of brucellosis in man in Wisconsin, five out of ten chicken blood samples collected were positive in dilutions of 1:8 to 1:32. Brucellosis was diagnosed in 5 of 7 people on the farm—there had been an abortion storm in the herd followed by vaccination with strain 19. Of 2 dogs on the farm, 1 was positive and 1 was suspicuous to the blood test. No chickens could be obtained for attempted isolation.

Tuberculosis.—Avian tuberculosis is a widespread disease of birds often infecting swine and sometimes other animals, but only rarely man. Concerning the pathogenicity of avian tuberculosis for human beings, Feldman[54] states: "The information which may be assembled from a review of the literature leads one to believe that: (1) Infection with the avian tubercle bacillus does occur, although rarely in human beings; (2) in a large number of the reported cases the procedure followed to establish the identity of the avian type of the organism has been inadequate; and (3) the problem should be investigated further, particularly as regards certain conditions of the skin, lymph nodes, spleen, and bone marrow, the exact nature and etiology of which are obscure." He also reviews the literature (50 papers) on the relationship of avian tuberculosis to Hodgkin's disease of man with no definite conclusion.

Feldman specifically considers the suitability of the tuberculous fowl for human food as follows: "When food markets are supplied from territories where tuberculosis is prevalent among chickens, the question of the suitability of the tuberculous fowl for human consumption is important. The problem is pertinent, not only because of the possible transmission of avian tuberculosis to human beings, but also because of the natural aversion of most people to food prepared from diseased animals. In the absence of a nationwide, efficient postmortem inspection of poultry, the only assurance to the consuming public that carcasses of dressed poultry represent healthy animals is the integrity of the merchant and the ability of the laity who dress fowl to recognize morbid processes."

Tuberculous lesions are found in many parts of the bird carcass: kidneys, ovaries, peritoneum, joints, etc. The occurrence of such lesions is not, however, conclusive, as other diseases which sometimes do not require condemnation produce similar lesions (infectious enterohepatitis, visceral lymphomatosis, myelocytomatosis, fibroma, etc.)

Pullorum Disease.—For the past fifty years this disease has been the one causing the greatest financial loss to the poultry industry. Several recent reports[5,6,7,8] in the literature of infection in man with this poultry pathogen, *Salmonella pullorum*, give some indication as to the causes of some cases of previously undiagnosed gastroenteritis in man. The disease is highly fatal to chicks; older birds often recover and become carriers. The organisms frequently localize in the ovary and then pass on with the egg to infect the newly hatched chick.

Evidence of a carrier infection in birds is shown by ruptured, dirty, inflamed, or coagulated ova and degenerated or inflamed gonads. Frequently, carrier birds develop a generalized septicemia as a result of rough handling in the course of marketing, with resultant rupture of the ova. The carcasses of these birds contain great numbers of the pathogenic organism, and the utmost care should be used to remove such carcasses from food channels. The lesions of septicemia include hemorrhagic enteritis and punctate or petechial hemorrhages on the pericardium, pleura, proventriculus, mesentery, kidneys, lungs, liver, spleen, and other serous and mucous membranes. Cyanosis and dehydration of the musculature, fascia, and derma are also frequent evidences of septicemia. Necrosis, hyperemia, anemia, or inflammatory changes in the organs and parts of the carcass give valuable information as to the pathologic and metabolic changes which determine the wholesomeness of the carcass. The inspector must understand the physiology and be able to interpret the pathologic picture, in order to determine whether the disease is localized or septicemic in character. This is necessary if one is to pass correct judgment on the carcass in accordance with modern public health concepts.

Fowl Typhoid. — Shigella gallinarum causes fowl typhoid in birds and occasionally gastroenteritis in man.[5,6] The disease is on the increase, and very heavy losses in both chickens and turkeys have occurred in the past few years. Postmortem examination shows anemia of the musculature, head parts, skin, and kidneys. The liver is hypertrophic, mahogany or greenish in color, friable, sometimes with necrotic foci distributed throughout. The spleen is markedly enlarged, congested, and frequently contains tiny, grayish white spots. Grayish nodules and areas of degeneration may appear in the myocardium and the pericardial sac. Chronic infection of the gonads is a frequent finding in recovered birds.

Salmonellosis.—Salmonella infections in human beings are now receiving a great deal of consideration by public health officials, and a great deal of material is appearing in the literature concerning Salmonella infections in man as the result of exposure to avian salmonellosis.[55-66] Darby and Stafseth[55] review the literature up to 1942. Their findings show that at that time 35 species of Salmonella affecting birds had been found in the United States. Literature is cited incriminating most of these species in pathologic conditions in man. Since that time, several other Salmonella species have been found to be pathogenic for both birds and man.[56] Epidemiologic examinations by thhe medical services of the armed forces during the war have emphasized the importance of these organisms in the health of military personnel.

Barnes[57] reviews some of the literature and concludes "An outstanding feature of the brief list of salmonella types according to their sources is that *fowls are by far the main animal reservoir of organism affecting man; this is a point that cannot be over-emphasized, since it may often aid in solving the origin of an outbreak of salmonellosis.*"

As early as 1939, Edwards[67] stated that poultry constituted the greatest reservoir of paratyphoid infection among domestic animals in the United States.

Postmortem findings in birds include inflammation of the duodenum and hyperemia of the liver, kidneys, gall-bladder, and myocardium. Excessive straw-colored pericardial fluid may be present, as well as caseous plugs in the cecums. Dehydration of the musculature can often be observed. Localization of these organisms in the air sacs and articular surfaces as well as the gonads is not uncommon.

Purulent Processes.—Staphylococci and streptococci, which cause pus formation and blood poisoning, are pathogenic for both man and birds. The frequency with which our inspectors suffer from such infections while working on the inspection line indicates the public health importance of these infections. Avian staphylococcosis is frequently characterized by an inflammatory swelling of the foot or wing joints.

Hinshaw[68] reports acute septicemic infection in birds with hemolytic Staphylococcus.

The infection is sometimes manifested as a dermatitis and omphalitis. Acute cases exhibit primarily a serous synovitis and arthritis, while in subacute cases the exudate is purulent and caseous in character and of a deep orange color. In many instances the articular cartilages over the fossae and condyles show marked erosions baring the underlying osseous tissue. The tarsometatarsal joints are the principal points of attack, but the femorotibial and metatarsophalangeal joints are occasionally affected.

Staphylococcus Food Poisoning.—This poisoning is produced by a toxin formed in the food before ingestion. This is one of the most frequent causes of food poisoning, and as the toxin liberated by these organisms during growth in a suitable medium is thermostabile, food poisoning may result even after the product has been cooked. References to this condition appear regularly in the literature.

The veterinary profession is charged with the responsibility for maintaining the health of the domestic animals and birds of this country, a position which it accepts and fulfills remarkably well under many unfavorable and discouraging circumstances which attend animal disease control work. However, the responsibility of the profession does not end in preventing the spread of disease from animal to animal but is the first line of defense in preventing the spread of diseases from lower animals to man.

The acceptance of poultry inspection by the packer, public health official, and public can be shown by the increased demand for this service. After nineteen years of operation, the service has grown to such an extent that 175 veterinarians are regularly employed in the performance of this work. During the calendar year 1946, 282,254,310 lb. of poultry were inspected, of which 2,789,043 lb. were condemned as unfit for food. Future demands for this service will undoubtedly require a great many more veterinarians. A more complete report on this service can be found in the papers by Edmunds,[69] Weckler,[70] and Brandly.[71]

The United States undoubtedly has the finest and safest meat supply in the world. This has been accomplished by maintaining the inspection of mammalian meat food products in the hands of the veterinary profession. It is hardly likely that such a standard can be maintained for poultry food products if the veterinary profession refuses to accept its responsibility in this important phase of public health work.

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Inauguration of Rabies Control Studies by the U. S. Public Health Service

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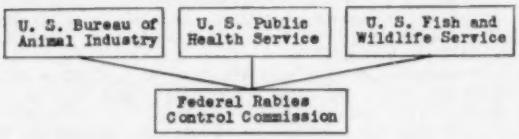
RECOGNIZING the alarmingly persistent increase in the incidence of rabies in this country, the U. S. Public Health Service has created a rabies control studies unit. This unit is one of the projects set up under the Veterinary Public Health Section of the U. S. Public Health Service. The latter, headed by Dr. James H. Steele, was organized to study the control of diseases transmitted from animals to man. The rabies control studies, recently begun, are being conducted at the USPHS Communicable Disease Center Virus Research Laboratories at Montgomery, Ala.



Proposed organization of rabies control commission.

LABORATORY DIAGNOSIS

One of the primary problems in the public health attack against any disease is the establishment of adequate diagnostic services using the most efficient techniques. In an effort to determine the simplest and most practical method of microscopic animal brain examination for rabies virus inclusion bodies, which we all know as Negri bodies, several widely accepted procedures are being tried at our laboratories. The final results of trial surveys with these varied techniques will be reported at some future date.

In considering methods for the preparation of brain tissue on a micro slide, three different techniques have been tried: the touch impression method, the so-called rolling technique, and the spread smear. In the touch impression method, small cut sections of Ammon's horn, cerebral cortex, and cerebellum are placed on clean blotting paper. The slide is then touched against the cut surface of the section and pressed gently downward with just enough pressure exerted to create a slight spread of the exposed surface of the tissue against the glass slide. According to the size of the section, three to four impressions can be made on one slide. Preliminary comparative observations at our laboratory have earmarked this method thus far as the preferred technique. In this method, a maximum amount of nerve tissue can be concentrated in a small area with preservation of nerve cell and glial structure. Since most of the histologic structure is kept fairly intact, the likelihood is greater for finding intracellular inclusion bodies.

The second method tried, the so-called rolling technique, consists of cutting a piece of brain tissue about the size of a fresh garden pea and rolling it gently over the entire surface of the slide with a toothpick or wood applicator. There is very little damage to nerve cell structure and a wide area of the slide is covered. However, in this method, the concentration of tissue material is rather sparse and with it is the possibility of missing a diagnosis in a brain with few Negri bodies.

In the third method, the spread smear technique, a small section of brain tissue is placed on one end of the slide. Another slide is used to crush the section of tissue against the first slide and then is drawn across the length of the slide. The result is a fairly homogeneous spread of a thin film of tissue covering about three-quarters of the area of the slide. In this spread smear technique there is a copious concentration of tissue (sometimes excessive if too large a tissue section is used) and a rather extensive area for examination. However, there are often varying amounts of damage to the neuron and glial structure, making it difficult to find intracellular Negri bodies and, when found, the latter may be fragmented or distorted.

Included also in studies of laboratory diagnosis are trials with various tissue

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stains used for Negri body examination of brain smears and tissue sections. Stains to be used will include Sellers' differential stain, Johnson's modification of Sellers', Mann's methyl blue eosin, Williams' differential stain, Mallory's differential tissue stain, Wolbach's modification of Giemsa, eosin methylene blue, hematoxylin and eosin, and others. Tissue fixatives to be tried will include air dried fixation, methyl alcohol, acetic Zenker's solution, and formalin.

In routine brain examinations, using only a few of the staining techniques, we have found thus far that smears and impressions show by far the most satisfactory results with Sellers' stain.[5] Furthermore, because this stain is dissolved in methyl alcohol, the tissues require no preliminary fixation since they are fixed and stained at the same time. This is probably the most important factor in making the Sellers technique the most rapid and most easily handled. We have found that the basic fuchsin content of the working solution must be varied to obtain optimum results. Johnson's modification improves Sellers' stain to a slight degree in that the basophilic staining inner granules of the Negri body are more readily demonstrable. This modification is manifested only in a slightly different proportion in the stock solutions of basic fuchsin and methylene blue and seems to enhance the differential properties of the stain. Sellers' stain shows the Negri body well-differentiated in a magenta or heliotrope to a pink-red, with dark blue to black basophilic inner granules. All parts of the nerve cell stain blue, and the interstitial tissue stains pink.

It is now universally accepted that Negri bodies cannot always be demonstrated in the brains of animals dying of rabies. For this reason, it is important that animal inoculations should be resorted to on Negri-negative brains. Working separately, Webster and Dawson,[6] Leach,[3] Johnson,[1, 2] and others in surveys of large numbers of rabies cases found that 10 to 12 per cent of those shown to be positive by mouse inoculation were missed by direct smear microscopic examination. Our own experience in smaller numbers of animals has thus far corroborated these figures on the percentage of Negri-negative cases diagnosed positive by animal inoculation.

Thus, it is strongly recommended that laboratories which furnish rabies diagnostic services be equipped to do animal inoculations of Negri-negative brain tissues. The operation is simple and inexpensive. The animal of choice is the white mouse, since it is low in cost, easily handled, and intracerebral inoculation of a suspension of infected brain material will produce typical and constant symptoms with an incubation period varying from five to eleven days with the consistent production of Negri bodies.

A practical procedure is to take a small amount of brain tissue pooled from Ammon's horn, cerebral cortex, and cerebellum, emulsify pooled material in sterile physiologic saline, and inject 0.03 cc. into each of 3 white mice. Daily observations of mice should be made for fourteen days and symptoms recorded. Microscopic examination for Negri bodies should be done on each mouse that has died. If there are no deaths at the end of the period of observation, the mice should be sacrificed in an attempt to demonstrate Negri bodies in the brains.

Often, animal brains shipped to diagnostic laboratories are grossly decomposed on arrival, making it impossible to inject mice without introducing complicating bacterial infection. Methods for treating suspensions of such contaminated material before mouse inoculation are now being tried. Bactericidal agents and antibiotic agents such as penicillin, streptomycin, merthiolate, phenol, glycerin, and ether will be included in these studies in an effort to find a suitable agent which will destroy the contaminating bacteria without affecting the virulence of rabies virus. Willet and Sulkin[7] have reported good results with the use of ether in concentrations of 10 per cent. Sellers reports satisfactory results with 0.5 per cent phenol and with a 1:5,000 solution of merthiolate.

Efforts to devise other means of diagnosis have never proved satisfactory. The histopathologic picture of rabies, such as inflammatory and degenerative changes in the brain and nervous tissue, is not sufficiently specific to be of any practical diagnostic value. By the same token, no one has yet been able to apply the use of a serologic test of any appreciable value. Although specific complement-fixing antibodies have been demonstrated in rabid animals, they are not present in sufficient quantities for the application of a complement-fixation test

which may be used as a dependable diagnostic aid.

CANINE RABIES VACCINE STUDIES

One of the principal objectives of the U. S. Public Health Service rabies project is to study the potency of various prophylactic canine rabies vaccines. Experiments are now under way (1) to determine the duration of immunity conferred by the available phenolized commercial vaccines; (2) to refine the system of dosage with these vaccines in order to obtain optimal immunity response; (3) to test the safety and relative antigenicity of newly developed live virus vaccines such as egg embryo vaccines; and (4) to test the efficacy of new experimental killed virus vaccines which have been inactivated with a variety of chemical substances and by ultraviolet irradiation. In connection with these studies, much time is being spent in the standardization and titration of the infectivity of different strains of fixed and street virus to determine their value for use as challenge viruses, as well as their adaptability for use as vaccines following treatment with various inactivating substances. The results of several of these experiments, now in progress, will be reported at some future date.

VIRUS-SERUM NEUTRALIZATION TESTS

One of the most important aids in our vaccine potency experiments is the serum neutralization test. In this test a standard fixed virus of known infectivity titer is used. This is determined by finding the 50 per cent endpoint mortality by intracerebral inoculation of a series of tenfold dilutions of the virus in mice. This standard virus is mixed with the serum of an animal and after varying periods of incubation and refrigeration the mixture is inoculated into mice, to test possible alteration in the infectivity of the virus by the presence of virus neutralizing substance in the serum. Since the titer, dilution, and dosage of the virus is known, the m.l.d. (minimum lethal dose) of the virus can be calculated. Thus, unknown serums can be run against varying dilutions of virus representing corresponding m.l.d. values. The number of m.l.d.'s of the virus in the mixture may be varied by diluting the virus and using undiluted serum or by diluting the serum and keeping the virus suspension constant.

In neutralization tests using unknown serums against 100 m.l.d.'s of standard fixed rabies virus, 4 mice are used for each blood, according to the method of Johnson. Depending on the mortality of the mice, it is possible to determine the degree of neutralizing protecting substance against a standard amount of virus. Thus, for example, if a given mixture of 100 m.l.d.'s of rabies virus and unknown serum is inoculated intracerebrally into 4 mice with a resulting rabies mortality of 4 deaths, we may say that the serum tested shows no evidence of the presence of virus-neutralizing substance against 100 m.l.d.'s of rabies virus. On the other hand, if a similar mixture is made using the serum of another animal, with a resulting mouse mortality of none out of 4, it is evident that there was a sufficient amount of neutralizing antibodies in the serum of this animal to offer complete protection against 100 m.l.d.'s of fixed rabies virus. Intermediate mouse mortality results may be interpreted as intermediate gradations of the presence of virus neutralizing substance in the blood of the animal tested.

The neutralization test was of inestimable value in the selection of animals for vaccine potency experiments. In an effort to obtain optimal conditions of comparability in the test dogs with regard to susceptibility to infection and immunity response to vaccination, pains were taken in the grouping and selection of the animals to give primary consideration to the amount of virus-serum neutralizing substance, as shown by neutralization tests of prevaccinated bloods, and secondary consideration was given to the age of the animal. This procedure was followed closely in tests involving comparative evaluation of various vaccines and was carried out in both vaccinated groups and groups of unvaccinated controls. After the animals were selected as nearly equal as possible with regard to their neutralizing antibody reactions, they were then subgrouped as comparably as possible according to age.

In order to study the effects of the various types of experimental vaccines on the amount of virus-neutralizing substance in the serums of the test dogs, series of postvaccinal neutralization tests are being carried twenty days apart in the periods between vaccination and challenge. In preliminary tests, thus far, results have shown that neutralizing antibodies against 100

m.l.d.'s of virus are present in 100 per cent of the dogs twenty days after vaccination. Ninety-six per cent showed the presence of completely protecting neutralizing substance, 2 per cent showed marked protection, and 2 per cent showed slight protection. Eighty-two per cent of the prevaccinated bloods showed little or no protecting neutralizing substance, and in every one of these cases there was a distinct rise in the blood level to marked or complete protection twenty days after vaccination. It will be interesting to watch the comparative effects of the various vaccines as to quantity and length of time which these neutralizing antibodies last after vaccination.

Although we are not convinced that the presence of rabies virus-neutralizing substance in the blood serum is an indication of true immunity against infection, we do feel that it is at present the most satisfactory tool in the laboratory for the determination of the relative susceptibility to infection and for the measurement of immune response to vaccination.

ALABAMA CONTROL STATUS STUDIES

Epidemiologic studies are now being conducted in Alabama on rabies incidence and control status for the year 1946. Information in this statewide survey is being collected with the coöperation of the Alabama Department of Health. It is intended that detailed studies and analyses will be carried out when data for master charts and spot maps have been accumulated. The items being considered in the Alabama studies are:

1) The number of animal rabies cases reported.
2) The number of human rabies cases reported.
3) The number of canine prophylactic vaccinations given.
4) The number of human vaccine treatments administered.
5) Number of stray dogs impounded.
6) Number of stray dogs destroyed.
7) Facilities for collecting and impounding strays.
8) Estimated dog population of county.
9) Facilities for laborary diagnosis.

It is hoped that information will be completed shortly so that epidemiologic studies on rabies incidence and a critical evaluation of the existing control programs can be made in this survey on a county-by-county and month-by-month basis. As a result of these studies, it is anticipated that recommendations will be made for the improvement of administrative and technical methods in local and statewide control activities. To demonstrate the effectiveness of such techniques, it is intended that one or more field control projects will be initiated on a county or multi-county health unit level. Methods to be employed in these field trials will include mass immunization of dogs, quarantine of exposed animals, collection and incarceration of strays, and trapping programs in areas where fox rabies complicates the problem of control.

In the field trials, it is intended that, with the coöperation of local authorities, personnel will be carefully selected to make up a wide-awake dog-catching team with the aid of one or more pickup trucks for the daily impounding of unvaccinated strays. Vaccination clinics will be held at appointed places in rural and urban districts over a ten- to 21-day period. Arrangements for vaccination will be made with the local veterinary practitioners in the county. The clinics will be preceded by a well-organized heralding campaign *via* newspaper, radio, placards, and individual mimeographed schedules distributed at strategic points throughout the county. As an adjunct in the campaign, all available educational material will be presented at civic and communal functions. If possible, county authorities will be urged to pass a local licensing ordinance carrying a nominal charge for the registration of all dogs. Although generally unpopular, dog licensing is one of the most important tenets of a successful rabies control program. It defrays expenses for dog control activities, making it a self supporting administrative operation, furnishes a reasonably accurate dog census, rids the county of unwanted strays, and places the responsibility of dog control activities squarely on the dog owner.

In operational areas where rabies in foxes is known to exist, it is hoped that augmented trapping programs will be set up with the coöperation of the State Wildlife Conservation Department and the U. S. Fish and Wildlife Service. Although the New York State Department of Conservation recently reported that trapping is of little value except as a barrier to confine animals in an endemic area, the experience in Georgia in 1945 has shown marked effect

in smothering several serious fox rabies outbreaks as a result of trapping programs in the southern part of the state carried out by the Georgia Fish and Game Department and the U. S. Fish and Wildlife Service. Observations in Georgia point out that the disease in foxes, when present in epizoötic proportions, will run its course in a year or more, the resulting mortality reducing the number of foxes until they are no longer a source of danger. The objective in control procedures is to reduce the fox population more quickly than the disease itself will and thereby shorten the period of spread of infection. Information from most states indicates that rabies epizoötics have been occurring almost inevitably whenever there is an overpopulation of foxes.

NATIONAL RABIES CONFERENCE, PHILADELPHIA, APRIL 9, 1947

Being presented elsewhere at this meeting by Dr. Raymond Kelser, chairman of the AVMA Special Committee on Rabies, is the report of the recent Conference on Rabies held at Philadelphia on Apr. 9, 1947. This Conference was called by Dr. Kelser with the idea of drawing together all interested national agencies in a discussion of the rabies problem on a country-wide basis. The agencies represented were the American Medical Association, American Public Health Association, American Veterinary Medical Association, American Animal Hospital Association, U. S. Bureau of Animal Industry, and U. S. Public Health Service. In essence, the points recommended by the Conference were that (a) rabies in the United States is of sufficient importance to make it desirable that the federal government participate in coördinating the efforts of the states in their control programs; (b) that rabies in animals should be made a reportable disease and the information be properly analysed and distributed to all states; (c) to facilitate control, prime consideration must be given to (1) adequate diagnostic facilities, (2) the control of animals capable of transmitting the disease, and (3) mass immunization of susceptible animals, particularly dogs. The recommendations of the conference were submitted to the representatives in attendance for official action within their own groups and for publication in suitable journals.

STATE RABIES CONTROL UNDER A FULLTIME VETERINARIAN

In the shaping of effective rabies control projects for the states, it is one of the objectives of our unit to urge that rabies control activities on a state basis should be under the supervision of a fulltime veterinarian. At the Southern States Regional Conference on Rabies[9] held on June 12 in Atlanta, it was pointed out that the experience of several states has proved the most successful programs are directed by a fulltime health department veterinarian who can keep constant vigil on the movements of the infection throughout the state and coördinate control activities of the state's political subdivisions.

REPORTING

Under the existing system, the official reporting agency for rabies in this country is the U. S. Bureau of Animal Industry. The material on rabies incidence is collected by questionnaires sent to the responsible rabies control agency in each state. According to the latest BAI report, a total of 10,782 cases were reported in animals and man for the calendar year 1946. It is commonly acknowledged that this incidence figure does not represent all of the cases that occurred, but isolated random observations show that this is a masterpiece of understatement. The principal reason for this inadequacy of reporting is that only those cases diagnosed by laboratory examination are published. For example, the 1946 BAI report for Georgia in two species is as follows: dogs—385, and foxes—266; at the recent Southern States Regional Rabies Conference it was brought out that in addition to the 385 positive dog heads diagnosed at the state health department laboratories, 638 clinical cases in dogs were observed and reported to the state. Besides the 266 positive fox heads, 500 clinical cases in foxes were observed and reported to the state. Thus, for all intents, the actual reported figures for the disease in dogs should read 1,023 and for foxes 776. The same story goes down the line for cases in farm animals showing total reported cases, including clinical diagnoses, as cattle 864, horses and mules 151, hogs 130, and others 16. Thus, the grand total of 2,960 cases reported to the Georgia Department of Public Health gives us an entirely different picture of the rabies situation in Georgia when

compared with the published 805 cases diagnosed by laboratory examination. I feel certain that, if followed closely, the same situation would be found in every state where rabies is known to exist.

Oddly enough, the same rule of postmortem laboratory diagnosis applies to human cases. For instance, the BAI report shows 1 human case of rabies for the state of Alabama during 1946. This was the only case diagnosed by microscopic examination of the brain at autopsy. However, I have in my files the names, addresses, clinical histories, and copies of the death certificates of 3 additional persons who died of rabies following the bites of dogs proved rabid. And yet, because microscopic examination of these persons' brains was not performed, they were not included in the human cases reported.

While it is evident that laboratory examination of the brain is the most reliable method of diagnosis, and that expansion of laboratory diagnostic facilities in every state is strongly urged, it is recommended that reporting methods be revised to include actual clinically diagnosed cases reported which cannot be conveniently forwarded to state laboratories for microscopic examination. In this way, we may at least approach a more nearly accurate evaluation of the seriousness of the problem in affected areas throughout the country.

EDUCATION

I think I probably reach home when I talk to the practitioners present about the attitude of so many dog owners throughout the country, who still believe that canine rabies vaccination is only a racket to increase the business of the veterinarian.

Still another stumbling block in the path of rabies control programs is the fact that, in general, people will rebel against any new regulatory legislation, especially when it involves taxation—as in dog licensing ordinances and laws.

We feel that if we can make the public think of these regulatory measures on licensing and registration as a means of combating a serious disease problem, and dispel their prejudiced attitudes, that this type of legislation is promoted as just another devious source of local political revenue, we will have come a long way.

It has been found that one method of accomplishing maximum public coöperation is the appointment of a rabies advisory committee in each of the various counties and municipalities. This committee should be formed from a number of the interested, influential, and respected citizens of the community. Zeissig,[8] reporting on the experience of New York state suggests that the ideal rabies advisory council may consist of the local health officer, a veterinarian, the dog warden, a representative of the local sportsman's club, and one or more dog owners. A committee of this type can hold meetings from time to time, gather the latest information on rabies control, and formulate educational campaigns. Thus, through their everyday contacts they can foster confidence in the citizens of the community.

The great need for educational material in rabies control is self-evident. Recognizing the importance of this need, the Public Health Service unit is even now in the midst of producing an educational filmstrip on the control and eradication of rabies. This filmstrip, entitled "The Fight Against Rabies," is now in production and should be released sometime within the next few months.

This film is the first in a projected series of audiovisual aids to be developed as part of our educational program and has been prepared for lay and subtechnical groups. The filmstrip acquaints the audience with symptoms of the disease in animals and in man, refutes popular misconceptions such as seasonal prevalence, stresses the 100 per cent fatality rate of the disease, presents the hazards of an uncontrolled epidemic, gives methods of transmission, and suggests means by which citizens can coöperate with local and state health authorities in combating its introduction and spread through a community. Many of the points on control are illustrated by simple dramatization. Forceful propaganda for mass immunization of dog populations is also presented. The film should serve as an orientation tool to the problems of control for health department workers, and also as a mass educational device for the layman.

Subsequent films will be prepared with specialized material of a more technical nature and will be used as a training aid for professional and technical health groups. These films will include demonstrations of administrative and technical control pro-

cedures, reporting methods, improved diagnostic techniques, and immunization methods based on results of our laboratory investigations and field trials.

FEDERAL RABIES CONTROL COMMISSION

We know that many communities in the country have demonstrated phenomenally effective rabies control programs. But we also know that neighboring communities have weak programs. We have seen epidemics reintroduced into rabies-free areas. We know that where one state employs one type of control program, the state to the north of it uses another which conflicts with the strategy and tactics of its neighbor, while the state to the east has no planned program at all—and so it goes down the line. The rabid animal knows no county lines, no state lines, but is driven by pathologic impulse to roam for miles and cause the spilling of an epidemic from one area into another.

Since we realize that eradication of rabies is not possible in this country unless a properly authorized national agency assumes the responsibility of coördinating rabies control activities, it is our hope, that we may be able to help lay the groundwork for the formation of a federal rabies control commission to be composed of members from the U. S. Bureau of Animal Industry, U. S. Public Health Service, and the U. S. Fish and Wildlife Service.

With such a commission, a uniform pattern of rabies control methods, based on proved scientific information, can be drawn for adoption and action by the states. Thus, the commission could (1) distribute to the states the latest accepted diagnostic procedures; (2) institute an accurate system of reporting; (3) keep local control authorities posted on the most effective immunization techniques; (4) draw up model licensing and dog control ordinances; and (5) prepare and distribute educational material to assure wholehearted coöperation by the general public.

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Six Applicants for Every Seat in Veterinary Schools

Between 75 and 90 per cent of the qualified preprofessional students will never be admitted to their chosen professional schools, according to an Ohio State University survey. There are openings for only about one out of every six qualified applicants in the veterinary colleges. In medicine and dentistry, the ratio of applicants to openings runs as high as 18 to 1 in some places.

The grand champion steer of the 1947 International Livestock Exposition (Chicago) sold for $8.00 per pound at auction, December 4. A Chicago restaurant supply firm paid $8,800 for the animal, which was owned by an 18-year-old Oklahoma boy, Claude Millwee.

The major portion of the $3 billion poultry industry always has been, and is destined to remain, a sideline of small scale farming. On the other hand, turkey growing is likely to become more and more the product of the exclusive turkey ranches. In both instances, an important factor is disease.

"You can't control anthrax by the sale of vaccines through the Piggly-Wiggly stores." —*Dr. Louis Leonpacher, Lafayette, La., in a symposium on anthrax at Southern Veterinary Medical Association Convention.*

Correction

In the legend for the picture of the Nashville meeting in 1897 (Dec. JOURNAL, pp. 484-485), Dr. Sesco Stewart was identified as (80) instead of (90). We hasten to correct this typographical error as (80) is an unidentified woman and Sesco Stewart is probably the most widely recognized figure in the whole picture.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

The Causes and Diagnosis of Infertility in Bulls

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IN the evolution of knowledge concerning the pathology of reproduction, the male has been assigned a minor rôle. Clinicians of the past noted that some bulls were unable to copulate, that others failed to ejaculate spermatozoa with their semen, and that others failed to produce conceptions. Such animals were comparatively few, were usually promptly recognized and discarded and, consequently, constituted a minor source of loss. Generally speaking, they regarded sterility, abortion, retained afterbirth, and pyometra strictly as maladies of female etiology and incidence. Slowly this concept has been forced to give way to the facts, and we now know that the bull can be, and frequently is, responsible for many of the pathologic phenomena of reproduction which were formerly considered to be strictly female in nature.

The advent of the artificial vagina and subsequent studies of bovine semen have demonstrated conclusively that there are all degrees of lowered fertility in bulls. Grading from the sire with abundant sexual vigor, who settles all healthy females in one or two services and produces conceptions resulting in healthy, vigorous, full-term progeny, to the bull whose semen is devoid of viable sperm, there is a long gradation of degrees of infertility. We now know that although a bull's semen may be able to fertilize the ovum, because the spermatozoa are pathologic, the fertilized ovum is ill from the beginning. The final result may be a monstrosity, a weak premature calf or, as is more common, the diseased embryo perishes early without the pregnancy having become clinically recognizable. In any case there is injury to the breeding health of the female.

It is not essential in such cases that the bull transmit infection to the female. Sick or dead embryos invite infection from any and every available source. When such sires are used, the pathologic condition expresses itself in the well-known phenomena of irregular heat periods, pyometra, abortions, retained afterbirth, dystocias, and sterility. Frequently the damage is so extensive that when such females are subsequently mated to healthy males they conceive only with difficulty, if at all.

The time is at hand for thhe clinician to be conversant with, and to make full use of, the knowledge gained by research and clinical observation in evaluating the fertility of the herd sire. Veterinarians who deal with breeding problems of dairy cattle are realizing more and more that the quality of the semen of the bull must be given major consideration when evaluating the fecundity of the herd.

Presumptive evidence of male fertility is no longer enough. Our experience with artificial insemination has taught us how to detect, by direct examination of the semen, those bulls that are a menace to the breeding health of the herd. We owe it to our clients to know how to collect semen with an artificial vagina and to evaluate it by means of those techniques that have been worked out for us by research so that they are now entirely practical for field use and simple enough to be mastered in a few hours by any veterinarian who is willing to spend the time. Anyone interested in these techniques will find a trip to the nearest artificial insemination bull stud highly instructive.

Unfortunately our knowledge of the pathologic background behind the abnor-

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malities that appear in bull semen is limited. There is a great need for further investigation of the pathology and teratology of the male reproductive tract and its effect on semen quality, and finally on the breeding health of the females mated to bulls with different levels of semen quality. We also need to study more deeply the correlation between the various detectable abnormalities of semen and the pathologic lesions of the male reproductive tract that is producing them. By studying the condition of the genital tract by clinical examination and, wherever possible, by postmortem histologic examination, we should be able to find a significant pattern. In this way it should be possible some day to examine semen and say with some authority that the cause of infertility was thus or so.

Recently Erb and Andrews[1] described a technique for the simultaneous measurement of semen quality and testicular histology in vitamin A deficiencies in dairy bulls by means of a biopsy. It would seem that this biopsy technique should have wide application if properly developed in helping to arrive at an accurate diagnosis of infertility.

CAUSES OF INFERTILITY

Infertility in bulls is caused (1) by inflammatory processes of the testes (orchitis) and inflammatory processes of the tubular genitalia, (2) testicular hypoplasia and degeneration due to hormone deficiencies and other causes, and (3) by functional disturbances due to systemic ill health, senility, malnutrition, obesity, and lack of exercise.

Much has been written concerning inflammatory conditions, and they can be diagnosed with a reasonable degree of certainty. Clinical examination reveals much that is of interest. However, this subject has been well covered in the established literature and time does not permit reviewing it here.

Orchitis.—Orchitis, unless due to brucellosis or tuberculosis, is usually acute and of short duration. Infection and trauma are the chief causes. The prognosis is unfavorable for the fertility of the patient, because the seminiferous tubules degenerate rapidly during the inflammation leading to permanent loss of spermatogenic power. I have had the opportunity to study quite closely the semen picture in 5 different dairy bulls during and following cases of acute orchitis and have examined the semen of many others in which adhesions and other evidence lead me to make a diagnosis of infertility due to a previous orchitis. In the 5 first-mentioned bulls, the rapidly progressive deterioration of semen quality followed quite a definite and constant pattern. When the inflammation had subsided, the picture was analogous with those of the latter group in which there was evidence of a past inflammatory process. In none of these bulls was there any lessening of sex urge. All of them copulated as readily as before they were affected. In two cases, in the owner's opinion, libido was enhanced.

Early in the inflammatory process there was a marked change in the gross appearance of the semen. The color was creamy, yellow, or yellowish green. Volume was increased, and agglutination was so rapid that after standing for a few minutes the sample had a "curds and whey" appearance. On microscopic examination the character of sperm motility was altered. The tendency to swim in swirls and eddies was lessened or absent, and a large percentage of immotile sperm were seen with much clumping. Examination of stained slides revealed an abundance of pus cells, débris, and a high percentage of sperm of abnormal morphology.

In all cases, after the orchitis had subsided, the semen sample was transparent, watery and, in most cases, devoid of sperm. The occasional sperm that could be found on careful search was immotile, but normal in morphology. As time progressed, the volume of the ejaculate was gradually increased to abnormal proportions, presumably with secretions from the seminal and other accessory sex glands. It was not uncommon to collect ejaculates of from 12 to 18 cc. In a large percentage of these bulls, this abnormal volume was not decreased materially until after the third or fourth successive ejaculate. It is possible that this latter phenomenon is the result of hypertesticular hormone output resulting from the inflammation. This point has not been checked.

Testicular Hypoplasia.—Of much more frequent occurrence than orchitis in both beef and dairy bulls, but less spectacular in its clinical symptoms and manifestations as a cause of lowered fertility or sterility, is testicular hypoplasia, or under-

development. This condition is associated with varying degrees of testicular development and is not generally related to the general health and development of the animal. Sexual desire is usually normal and coitus is performed readily and naturally. The testicles are subnormal in size and soft to the touch. There is every possible degree of hypoplasia. If the condition is mild, the bull may show a low or indifferent fertility. The testicles may be nearly normal in size and consistency, and the diagnosis is dependent upon a careful analysis of the semen picture, the breeding record, and a histologic examination of sections obtained by biopsy.

Extreme cases of hypoplasia are totally sterile and consequently of little significance, since they are discovered and discarded soon after they reach breeding age. In milder cases, some seminiferous tubules are normal or nearly normal in development, and there exists as a result a low degree of fertility. Semen studies afford the most reliable means of diagnosis. The volume of the ejaculate, together with the sperm concentration, are highly significant. They reflect reliably, according to Kingman[2] and others, the amount and condition of the parenchyma of the testes. Healthy semen is opaque white. In hypoplasia it is thin, watery, and may in some cases have a yellowish tinge. The volume is always below average. The semen of healthy bulls contains from 300,000 to over a million spermatozoa per cubic millimeter, with a volume range of from 3 to 8 cc. and an average of 5 cc. In hypoplasia concentration varies from 0 to near normal, depending on the degree of development. Examinations of stained semen slides in these cases regularly reveal abnormal morphology. The ratio of abnormal spermatozoa increases in proportion to the degree of hypoplasia. Tailless heads, pyriform heads, and tails wrapped around the head are the most common abnormalities observed. The presence of protoplasmic droplets about the neck of the sperm is a constant finding. One such bull under my observation consistently ejaculated spermatozoa, 30 per cent of which had these protoplasmic droplets.

Histologic studies of testicular tissue from this class of bulls reveals considerable variation in the arrest of development of the seminiferous tubules. In some areas there is very little left beyond the basement membrane. In others there will be several layers of germinal epithelium. Some evidence of spermatozoa formation can be seen, but most of the spermatids show evidence of degeneration.

A histologic study of the testes of bulls of known breeding records and semen pictures soon convinces one that hypoplasia passes from absolute arrest, by a long series of graduations, to the normal. The observed histology corresponds closely to the fertility of the individual as observed from his semen picture and breeding record.

Most writers attribute testicular hypoplasia largely to heredity, and there seems to be little doubt that this hypothesis is true. No doubt hormone deficiencies fit into the picture, too. In recent years fashion and market demand have caused beef breeders to select a type with extreme tendency to store fat and to mature early. Anyone who has had experience in dealing with the breeding problems of this type of cattle knows that in those bulls that approach closely the ideal in type some degree of hypoplasia is almost universal. In selecting for a blocky type, early maturity, placid disposition, and extreme tendency to store fat, have we been unconsciously selecting for hypothyroidism and perhaps other hormone imbalances? No one knows, but it's something to think about.

In dairy breeds where calves are hand raised and pail fed, malnutrition in some degree during the first six months of life is the rule. It would seem logical that during this period, when the sex system is developing rapidly, that any important disturbance to the general health of the young potential sire would result in some degree of genital arrest. At least it is a subject that should be investigated.

Testicular Degeneration.—Thus far we have discussed conditions of the testicles in which the seminiferous tubules either had been lacking in the ability to produce healthy normal spermatozoa from the beginning or had lost that ability as a result of inflammatory invasion of the gland. There are other cases in which the seminiferous tubules lose their power to produce physiologic spermatozoa gradually or suddenly in bulls that have been previously fertile, and for reasons other than infection or inflammation. Such cases are classified as testicular degeneration. Attempts to assign a definite cause to this phenomenon

leads one far into the field of speculation. It is a well-known fact that insulation of the scrotum soon leads to testicular degeneration, and Erb and Andrews[1] have shown that in vitamin A deficiencies degeneration occurs. However, in these cases regeneration occurred quite rapidly when the exciting cause was removed.

We know that from an endocrine point of view the testes are dependent on the luteinizing hormone of the pituitary for their growth and maintenance and on the follicle-stimulating hormone (FSH) factor for their function of spermatozoa production. It is likely that in many cases endocrine failure is the basic cause.

I have observed other cases in which the degeneration followed soon after a severe systemic illness, confinement of the bull to a small pen with no opportunity for exercise, and where he was maintained on a grossly inadequate diet. In this group of cases fertility could be restored by correcting the errors of management which had caused it.

In those cases where the degeneration appeared to be spontaneous, treatment has been discouraging. Occasionally one of them will show some temporary response to hormone substitutional therapy only to become worse later on. Personally, I have never been able to treat one case successfully.

The semen picture in these cases is quite characteristic. The average volume per ejaculate is reduced. The sperm count is reduced and the percentage of sperm showing abnormal morphology increases in proportion to the degree of degeneration. One of the first signs of the onset of degeneration is a progressive change in the character of the motility of the live sample. The spermatozoa lose their ability to swim in swirls and eddies, movement is sluggish, and many immotile sperm will be observed. In cases where the degenerative process is well advanced, the sample is devoid of sperm or contains only a few heads or a few grossly abnormal sperm. Libido is usually suppressed but still present.

Infections of the Tubular Genitalia.— Thus far we have attempted to show that the testicles must be healthy and normally developed to produce physiologic spermatozoa. It is also imperative that the tubular canal through which they pass, and the accessory glands that contribute to the ejaculate, must be functional and free from pathology if the sperm are to reach the exterior without serious damage or contamination. Infections of the seminal glands, ampulae, and epididymus, while not common in bulls, do occur. Brucella infections frequently cause abscesses of the ampulae and seminal glands. Disease of the tubular genitalia is, in my opinion, a serious menace to the breeding health of the females served by the affected bull. The few cases that have come under my observation were discovered as a result of a search for the cause of widespread and recurrent attacks of cervicitis, vaginitis, and other more serious breeding troubles in the females of the herd. Examination of the semen in these cases regularly reveals the presence of pus. Usually, the spermatozoa are normal, or nearly so, in both motility and morphology. The volume of the ejaculate, as a rule, remained within the normal range. In one case, in which rectal examination revealed a swollen and sensitive seminal gland, the volume of the average ejaculate ran rather high, presumably augmented by rather generous amounts of pus. In this particular case motility of the sperm was very poor.

Properties of Healthy Semen

So far in this paper, reference has been made from time to time to abnormalities of semen. It would seem to be in order at this time to describe what I consider to be the observable characteristics of good semen. Good semen is an opaque white. If a drop of it is placed on a slide and examined under the low-power objective of a microscope, it is found to be teeming with an uncountable number of spermatozoa which move in waves and swirls across the field. Good quality, fresh, live semen always shows this type of motility. Apparently high percentages of morphologically abnormal sperm, or immotile sperm, break up this tendency to swim in swirls and eddies. Studies of stained slides of good semen show great uniformity of size and shape of the individual sperm. The ratio of recognizably abnormal sperm is low. Williams set the allowable maximum at 170 per 1,000 or 17 per cent. In most bulls of excellent fertility and sex vigor, it will run considerably less than that. The sample will be free from extraneous material such as pus cells, casts, and débris, although an occasional epithelial cell will be seen.

In evaluating herd sterility problems, the sire whose semen meets these qualifications and who is capable of carrying out the mechanics of copulation can generally be eliminated as a factor in the problem. Trichomoniasis is the one important exception to this rule.

COLLECTING SEMEN FOR STUDY

There are certain pitfalls encountered by the practitioner who only occasionally collects semen with an artificial vagina for purposes of evaluating male fertility that seem worthy of mention here. It is best to base one's evaluation on several ejaculates preferably collected on two or more different days. Even the best bulls ejaculate poor quality samples once in a while for no explainable reason. Semen is highly susceptible to the action of heat, cold shock, chemicals, and water. The glassware used in collection must be chemically clean and dry. It is best to adhere strictly to the procedure outlined in one of the many excellent available bulletins on artificial insemination for the cleaning and sterilization of glassware.

Careful attention should be given to the temperature inside the water jacket of the artificial vagina. At the moment of collection it should be between 105 and 110 F. Bulls do not object to much higher temperatures, but if any semen contacts the rubber inner liner at temperatures much above 110 F., the sample will not be suitable for fertility evaluation.

SELECTION AND CARE OF BULLS

The veterinarian who conducts a practice in which he deals with problems of infertility is the logical person to disseminate constructive information regarding measures for the prevention of sterility and the management of sires in such a way as to keep them at the peak of sexual vigor. In the past animal husbandry men have fallen into serious error in their process of selection of breeding stock. They have paid little or no attention to breeding vigor but have concentrated primarily on type, and, in the case of dairymen, on short-term production records as well. All too frequently, great families of cattle have been developed that approached very closely to the ideal for beef or dairy production, only to die out because they lacked the reproductive vigor to perpetuate themselves. No one yet has found a way to circumnavigate the ancient law that like begets like, and until such time as we learn to select as sires only those animals that are descended from prolific ancestors, we will continue to have a serious problem with impotent bulls.

As stated earlier in this paper, the first few months of a bull calf's life are important in the development of the reproductive system. It is customary for beef breeders to push their bull calves to the maximum during this period. Calves nurse the dams, are creep fed, and not infrequently have access to nurse cows as well. As a result, they are fat from birth to maturity. Their scrotums are insulated with fat at all times, and there is little doubt but that this results in considerable inhibition of testicular development. Dairymen, on the other hand, tend to maintain their bull calves in a state of malnutrition during the pail-feeding period which, in many cases, is harmful to sex as well as general development. Calves that are selected as potential sires should be fed and managed in such a way as to obtain maximum sustained growth without obesity if they are to obtain vigorous reproductive development.

It has been said many times that the sire is 50 per cent of the breeding herd. The estimate is conservative. As such he deserves more consideration than he usually receives. The general health and vigor of a bull, the care he gets, and the quality of his semen are indeed closely related. Green feeds, protein supplement, enough minerals to supply his needs, and an abundance of daily exercise are essential to his breeding health.

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[2]Kingman, H. E.: Semen as an Index to the Physiology and to the Pathology of the Male Genital System. North Am. Vet., 28, (Feb., 1947): 82-88.

Protamine vs. Heparin.—The anticoagulant action of heparin can be counteracted by intravenous injection of protamine, a fish protein chemical, according to a report by Detroit surgeons made at the recent New York meeting of the American College of Surgeons. One injection of protamine is said to bring much delayed clotting time back to normal in five minutes.

Why Hormone Treatments Sometimes Fail

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IN this discussion an attempt will be made to outline the various causes for the difficulty in obtaining satisfactory results with hormone treatments. Comments will be confined to reproductive and closely allied disorders, since the uses of such endocrine products as epinephrine and pitocin are well established.

While the reproductive hormones are sometimes used for other purposes, they are most frequently used to replace the normal secretions of the body or to establish a balance in the endocrine system. Their use is designed to render the body normal in a direct manner, whereas most drugs are employed to cause an abnormal response in some organ or body function with the hope of allowing or promoting recovery from some pathologic disturbance.

Three general factors are responsible for most of the unsatisfactory treatments. These are the relative lack of fundamental physiologic knowledge, the failure to make complete, specific diagnoses, and the presence on the market of many products of uncertain content and unknown strength. These are interrelated but will serve as a convenient classification for discussion.

LACK OF FUNDAMENTAL PHYSIOLOGIC KNOWLEDGE

This is undoubtedly the most important of the causes for failure and may in turn be attributed to several factors.

Relative Infancy of the Field of Endocrinology.—Not the least of these factors is the relative infancy of the field of hormone study. While many drugs have been known and studied for many decades, our most useful information about hormones has been accumulated in about the last twenty years. We must admit that in some instances it has not yet been established exactly *what* hormones do in the body, and *how* they produce their effects is still more obscure.

Further evidence of this newness of the field is seen in the confused nomenclature in the literature. Some time ago, the author started a compilation of the various terms which have been employed to designate the estrogenic hormones of the ovary. At the last count this list contained some 60 terms, and it is feared that the roster is far from complete. This confusion is also found in naming the various gonadotropic hormones. When first discovered by Ascheim and Zondek in human pregnancy urine, they were believed to come from the anterior pituitary and were called Prolan A and Prolan B. Later they were found to be of placental (chorionic) origin. The original terms were then changed to anterior pituitary-like (APL) hormones. More recently the anterior pituitary hormones have been designated follicle-stimulating hormone (FSH) and luteinizing hormone (LH), but these terms are still confused with Prolan A and Prolan B. The term, "chorionic gonadotropin," is most often used as synonymous with the gonadotropic hormones of human pregnancy urine (PU), whereas the gonadotropins from pregnant mares' serum (PMS) are believed to be also of chorionic origin.

Cyclic and Complex Nature of the Female Reproductive Physiology.—The cyclic nature of the female reproductive physiology is a factor of prime importance. Since the amounts of gonadotropic hormones, of estrogen, and of progesterone in the system fluctuate continuously, in order to restore a normal balance, we must not only attempt to determine the stage of the cycle but the dosage needed to produce the desired result. Depending on the stage of the cycle and other factors (such as nutrition and route of administration), considerable variation in response to a treatment may be seen. Andrews[1] states that gonadotropic hormone administration sometimes results in ovulation without estrus, estrus without ovulation, multiple ovulation, excessive follicular growth without ovulation, abnormal luteinization, or no stimulation at all. To illustrate this, in attempting to

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induce ovulation it is necessary to have well-grown follicles and no active corpus luteum. Injection of PMS (mostly follicle-stimulating) in the cow will cause a large number of follicles to ripen. Whether or not any of these ovulate will depend on the state of the corpus luteum, if any. If no corpus luteum is present (as in anestrus), the first follicle to ripen may rupture spontaneously, and the corpus luteum resulting will inhibit further ovulations. If a corpus luteum is present, no ripe follicles will rupture, unless the corpus luteum is expressed manually, in which case all of the ripe follicles may rupture, producing superovulation. The estimation of dosage and choice of product would appear, therefore, to be much more difficult (and more important) here than in the routine use of drugs, since we are dealing with fine balances in a cyclic physiologic sequence.

Interrelationships between the various endocrine organs add to the complexity. It is now well known that many endocrine organs, such as the anterior pituitary, the thyroid gland, and the adrenals, have important relations to the female cycle. It is difficult to determine which of these, if any, may have a rôle in the disturbance being treated. In addition, we now recognize more than one source in the body for many hormones, such as the estrogens and progesterone (from ovary and placenta), and the gonadotropic hormones (from anterior pituitary and placenta).

Each of these factors makes the cycle more difficult to work with both experimentally and clinically, so that a rational evaluation of results in the laboratory and in the field becomes most troublesome.

Species Variability.—Species variability further complicates our treatments. In the mare the follicular phase of the cycle dominates the luteal phase; in the cow the reverse is true. Thus, there is a tendency in the cow for the corpus luteum to persist and inhibit heat periods, although follicles may ripen and rupture (silent heat). In the mare follicular growth is emphasized, and these ripe follicles may fail to ovulate, since the luteinizing hormone is needed and is not very plentiful. Therefore in the mare, the use of PU (mostly luteinizing hormone) to cause rupture of ripe follicles is indicated, whereas ripe follicles will ordinarily rupture in the cow as soon as the corpus luteum is inactive. Artificial ovulations induced during the luteal phase of the cycle tend to yield eggs of low fertility; eggs with normal fertility are usually produced when ovulation is caused during the follicular phase.

Other examples of species differences are numerous. The threshold of estrogen needed to produce estrus is highly variable. The cow requires less than the sow and ewe, and the mare requires more. There are likewise qualitative species differences. The synthetic estrogen, stilbestrol, has been shown to increase milk yield in cattle, but at the same time it tends to damage the reproductive apparatus. This detrimental effect does not follow its use in goats, which indicates that trial of more compounds may uncover one which is less harmful (and therefore more useful) in cows.

These species variations not only make treatments of individual animals more difficult but lead to generalizations which are not always useful. For economic reasons, much of our experimental work on these problems is done on small laboratory animals, such as rats, guinea pigs, and rabbits. The principles learned from these researches are sometimes applied to other species without sufficient testing. Thus an effect produced in the rabbit may not be seen in the dog or in cattle, and further work must be done. It is hoped that the AVMA Research Fund will obviate some of these difficulties by providing sufficient funds for studies in the larger animals.

Complex Chemical Nature.—Another factor which tends to retard our progress is the complex chemical nature of some of the hormones. The gonadotropic hormones, which should be most useful to us clinically as they are the key to the control of the gonads, are found to be proteins. This makes them hard to separate and to prepare in pure form, and it is at present impossible to synthesize them. Until we can procure these and other hormones in pure form, there is always some doubt as to the accuracy of the interpretation of our experimental results.

FAILURE TO MAKE COMPLETE, SPECIFIC DIAGNOSES

While completely accurate diagnosis in this field is most difficult, this should serve to emphasize its importance if we are to make a wise use of the treatments available. One authority (Frank[2]) in the human medical profession states that the most

common error in endocrine therapy is that of employing hormones when no deficiency exists. Therefore, we should attempt to make our diagnoses more specific than "cow shows no estrus" or "cow shows irregular heat periods." Perhaps the cow with no estrus is already pregnant. She may have a mummified fetus, or pyometra. A persistent corpus luteum will inhibit estrus. Old age may be the cause. Does the cow showing irregular heat periods have cystic follicles? Is she already pregnant but showing estrus occasionally? Since the cow has a very short heat period, has the owner failed to observe estrus? Is there an infection present?

We must also bear in mind that more than one cause may frequently be found. Quoting again from the human literature, Siegler [3] states that "causation of infertility is usually multiple, the average case presenting 3.2 factors."

In addition, as suggested previously, we should attempt to determine the present stage in the cycle so as to make a more rational choice of the treatment.

TYPE AND COST OF PRODUCTS AVAILABLE

There are on the market in the veterinary field many products which are of uncertain content and unknown strength. The use of "orchic extract" and "ovarian extract" where the content is described as the extracted material from a certain weight of testicle or ovary must be discouraged if we are to progress. Unless the product is assayed or is pure enough to be weighed to determine the quantity of active material, we not only are unaware of how much hormone we are administering, but we are not certain that *any* active principle is present. This is destined to lead to reports of failures. A word must be said in defense of the pharmaceutical houses supplying these products. It is a well-known economic fact that manufacturers make only those items which someone buys. The assayed and standardized hormone preparations are more expensive, but the use of crude extracts should be regarded as false economy. If, as is often true in veterinary medicine, the economic value of the animal does not warrant the use of the expensive preparations, it is probably wiser to use nothing than to attempt to get results with the cheaper products. The exercise of the latter choice may lead to condemnation of the whole field of endocrine therapy before it has been properly evaluated.

On the other extreme are some synthetic compounds which are so inexpensive and relatively nontoxic that they are freely employed for the clinical treatment of numerous ailments before an adequate knowledge of their properties has been accumulated. The best example is the synthetic estrogen, stilbestrol, which has been used therapeutically for so many things that many of the data derived are of doubtful usefulness.

Among the available products, there are some which are similar but which produce qualitative differences when administered. Preparations of human pregnancy urine (PU) and of pregnant mares' serum (PMS) are both gonadotropic in effect. However, they differ qualitatively in that PU is predominantly luteinizing hormone and PMS is predominantly follicle-stimulating. Recognition of these differences is essential to rational use of these hormones.

The foregoing remarks are not intended to discourage the use of hormone therapy in veterinary medicine but rather to stimulate thinking along certain lines which, it is believed, will result in a more rational use of the endocrine products.

These may be summarized in the following suggestions:

1) Make diagnosis as complete as possible.

2) Use hormones only when they are indicated. Remember that other factors, such as infections, may be at work.

3) Use only those products whose strength has been determined.

4) Select hormone preparations wisely. This will necessitate following the newer developments closely.

5) Dosage is extremely important.

6) Be sure of the nutritional state.

7) Keep up to date on species differences.

8) Interpret results critically.

For papers dealing with the uses for hormones in veterinary medicine, the reader is referred to those of Andrews,[1] Robertson,[4] Detweiler,[5] and Reece.[6]

DISCUSSION

CHAIRMAN EMMERSON: Thank you very much, Dr. Cairy. Any of you who have read the "Veterinary Record" know that the British are notorious for debates over differences of opinion. One way I remember things best is to have someone challenge me when I have said something about which there is a difference of opinion. Let us try to

enliven our discussion of these papers this morning. This paper is open for discussion. Please give your name and stand up when you state your question.

DR. CAMPBELL (Toledo, Ohio): Does an infection in the uterus tend to stimulate the ovary to produce more of the estrogenic hormones?

CHAIRMAN EMMERSON: Would you like to jot down some of these questions and summarize them? It might save time and prevent duplication.

DR. WOLFE: Dr. Cairy mentioned that an overdose of stilbestrol caused some damage. What was that damage?

QUESTION: I should like a little more detail. Would you discuss the damage done to the reproductive tract with stilbestrol, and how long that damage persisted.

CHAIRMAN EMMERSON: They are getting tougher, Dr. Cairy. Are there any other questions? If not, I will ask Dr. Cairy to answer them.

DR. CAIRY: I will probably have to sidestep some questions a bit, but the first one—whether or not there are shorter cycles or apparent evidence of stimulation of the ovaries when pyometra is present—I believe there will be pyometra at times when the ovaries are stopped from functioning, and at other times when they function faster. That is just another difficulty with which to contend. I don't know how we can get around it.

The other question concerned stilbestrol's damage to the reproductive apparatus. I don't know how deeply to go into the answer. Most of the damaging effects are seen when stilbestrol is used over a period of time to increase milk or some other body function. You will probably not damage the ovaries or reproductive organs of cattle by using it to induce estrus. The damage done is mainly to the ovaries. It is a general principle that estrogens administered in any quantity over long enough periods of time will eventually tend to atrophy the ovaries. It may not be peculiar to stilbestrol, but a general reaction of estrogens. Most of the damage is done in the ovaries themselves. No one has adequately described what is going on there but it stops functioning.

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Rabbit Castration

Castration improves the gains and the quality of the meat and pelt of rabbits (A. P. Lokk in *Veterinariya, 24,* July, 1947:35-36). Thirty-four rabbits were castrated, 5 by the closed method, and the remainder by the following open methods: ligation, crushing with Pean forceps, and simple torsion. The results were the same for each method. The wounds healed in six to eight days. In spite of the size of the inguinal rings, no herniation occurred in the open operations. The recommended age was 5 months. The rabbits were restrained by wrapping them in a towel or by tying them in a rabbit trough. To induce descent of the testes, the abdomen was massaged toward the inguinal rings with the left third and fourth digits. When the testes were in the scrōtum, the rings were blocked with the third and fourth digits, and the testis being removed was fixed with the thumb and index finger.—*R. E. Habel.*

Stilbestrol in Retained Placenta and Pyometra

Contrary to unfavorable reports on stilbestrol therapy in retained placenta, Chesney of England obtained successful results with this treatment over a five-year period (*Vet. J., 103,* July, 1947: 233-234). If the placenta was not expelled within thirty-six hours, an intramuscular injection of 10 mg. of stilbestrol dipropionate was given to small cows and 20 mg. to large ones. The majority of 200 treated cows voided the placenta in twelve to thirty-six hours, without subsequent pyometra. Afterbirths had a better appearance than those removed manually, were infiltrated with healthy serous exudate, and did not have a putrefactive odor. In a number of cases where the placenta was still retained after treatment, it was found on the floor of the vagina, detached from the uterus. Only 20 cases out of the 200 failed to respond.

Also in 30 pyometra cases given stilbestrol injections in the place of iodine irrigation, the uteri felt normal within a month and conception occurred in nearly all cases at the ninth week from calving. Most of the animals responded to two injections of 30 mg. each; only 2 cases had to be given a third dose.

Prevention of Shock

Close attention to hemostasis, along with early use of blood transfusions, is the best means of preventing shock. When loss of blood is not checked, hemorrhagic hypotension may progress rapidly to irreversible shock. Although recovery from irreversible shock is impossible, the administration of alkalis is useful in delaying its onset until more effective agents, such as blood and plasma, can be obtained.—*J. T. Cole in J.Am.M.A., Sept. 20, 1947.*

CLINICAL DATA

Treatment of Pneumonia in Cattle

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THE RECENT USE of the new sulfonamides, sulfamerazine and sulfamethazine, and the antibiotic, penicillin, in pneumonia in cattle has received much attention. The early results of the use of these products have been gratifying. It is the purpose of this report to present further information on these newer and better weapons in the fight on pneumonia in cattle.

Previous excellent work on the value of sulfanilamide, sulfathiazole, and sulfapyridine have been reported in the literature.[2, 6, 8] In the past two years, reports have been published on the value of the newer sulfonamides, sulfamerazine and sulfadiazine, in the treatment of pneumonia in cattle.[2, 3, 7] Sulfamerazine has been demonstrated to be of value. Thorp[7] treated 16 cases of calf pneumonia with this drug and had good to fair results in 87 per cent of his cases. McAuliff[3] treated 27 cases of calf pneumonia and 122 cases of hemorrhagic septicemia pneumonia with sulfamerazine, with recovery rates of 93 and 95 per cent, respectively.

Scheidy[4] described the blood concentration in cattle of sulfadiazine, sulfamerazine, and sulfamethazine. These three new closely related sulfa compounds are frequently spoken of as the pyrimidines. They have a somewhat similar chemical formula containing the pyrimidine ring. It was demonstrated that therapeutic blood levels of sulfamerazine and sulfamethazine were maintained over a period of twenty-four hours by a single oral dose of 1 gr. per pound of body weight. It was shown that these two pyrimidines had a rapid absorption rate from the digestive tract, and thus therapeutic blood levels were reached promptly. From the evidence presented by Thorp[7] and Francis[1] it appears that the pyrimidines are less toxic than sulfathiazole or sulfapyridine. Calves, however, are more susceptible to toxic reactions than cows. The following is a clinical report on experiments with sulfamerazine, sulfamethazine and, in a small way, penicillin in the treatment of pneumonia in cattle.

PROCEDURE

During the years 1945 to 1947, 222 clinical cases of pneumonia in cows and calves in 53 herds were treated by the Ambulatory Clinic of the New York State Veterinary College, Ithaca, N. Y. The diagnosis was made after examination of each animal revealed symptoms of pneumonia. After estimating the weight of the animal, sulfamerazine,* sulfamethazine,† or penicillin‡ was administered.

The average daily dose of the pyrimidines was 1 to 2 gr. per pound the first day, and ½ to 1 gr. per pound of body weight for the next two to four days. In most cases, the amount of drugs was further reduced to ½ to ¾ gr. per pound from the third to fifth days. This daily amount was given in divided doses two to three times daily, even though Scheidy[4] and Schroeder[5] report that one daily dose is sufficient.

Only 5 calves and 1 cow were given intravenous therapy with sodium sulfamerazine at the time of our first call. In these cases, ½ to ¾ gr. per pound of body weight was administered in a 5 to 12 per cent solution. The value

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*Supplied by Sharp & Dohme, Inc., Philadelphia, Pa.

†Supplied by Lederle Laboratories, New York City.

‡Supplied by Schenley Laboratories, New York City; E. R. Squibb & Son, New York City; Merck & Co., Rahway, N. J.; and Lederle Laboratories, New York City.

of the intravenous injection of the pyrimidines as early as possible in pneumonia is obvious. It results in an immediate high concentration of the sulfa compound in the blood. This early attack on the disease-producing organisms results in prompt and often remarkable recoveries. Care was taken to see that none of the solution escaped into the subcutaneous tissues, as McAuliff[3] and others[4, 5] have noted a severe inflammatory reaction following this accident in intravenous injection with pyrimidine solutions. It should be noted that most of our cases treated with sulfamerazine occurred in the years 1945 and 1946.

Our work with sulfamethazine was done this past year, 1946 to 1947. As the initial treatment in 52 of 106 cases, intravenous therapy with a 10 or 25 per cent solution of sodium sulfamethazine was employed at the rate of ½ to 1½ gr. per pound of body weight. This high initial dose, 1 to 1½ gr. per pound, is necessary according to Schroeder.[5] He recommends 1½ gr. per pound the first twenty-four hours and ¾ gr. per pound daily for the next three to four days. McAuliff[3] and Scheidy[4] in their work with sulfamerazine recommend approximately the same dosage as Schroeder.

Symptomatic treatment of most of these cases tablets and sulfamethazine in 2½- and 15-gm. tablets. Thus, administration of definitely known amounts of the drug was facilitated.

In 19 cases where the value of the cow or calf warranted, or where the initial attack of pneumonia was severe, penicillin was administered intramuscularly. The dose was 100,000 to 200,000 units per 100 lb. of body weight daily. Aqueous solutions of penicillin were administered every three to four hours and the beeswax and oil solutions (Romansky formula) were administered once or twice daily. In these cases, the penicillin therapy was continued for two to three days, while the sulfa compounds were continued for two to three days longer.

Symptomatic treatment of most of these cases of pneumonia was used sparingly. In a few cases, strychnine tonic, brewer's or irradiated yeast, and cough syrup were prescribed. Of the 120 cases of pneumonia in adult cattle, 74 received 50 to 100 cc. of hemorrhagic septicemia serum. Of the 93 cases in calves, only 26 received 20 to 50 cc. of serum. Elevation of the forepartes relieved the symptoms of dyspnea in some cows. Vitamins A and D were prescribed for some calves where a deficiency was suspected. Wherever necessary and possible, all cattle with pneumonia were moved to clean, dry, cold quarters free from drafts. Detailed records were kept on all cases.

RESULTS

The results of the past two years' work treating pneumonia in cows and calves with the newer sulfonamides and penicillin are summarized in tables 1 and 2.

Sulfamerazine was used to treat 47 cases of calf pneumonia. Of these cases, 40 recovered and 7 died, with an 85 per cent recovery rate. Of 32 calves treated with sulfamethazine, 24 or 75 per cent recovered. Two calves were treated with penicillin only and recovered, and 12 others were treated by a combination of penicillin and sulfamerazine or sulfamethazine. Of these 14 cases, 12 (85.7%) recovered. It should be noted that the 2 calves of this group that died were severe cases under treatment with sulfamethazine for two days before penicillin therapy was begun. Thus, of 93 calves with pneumonia treated with sulfamerazine, sulfamethazine, and penicillin, 76 (81.7%) recovered. This recovery rate is about the same as reported by Jones,[2] using sulfathiazole, sulfadiazine, and sulfapyridine, but below that reported by McAuliff[3] who used sulfamerazine. It is the belief of the authors that in a larger series of cases, the percentages of recovery by the use of sulfamerazine and sulfamethazine would be approximately the same. Of 26 calves that received hemorrhagic septicemia serum, 5 (19.2%) died, and of 67 calves that did not receive serum, 12 (17.9%) died.

TABLE 1—Treatment of Pneumonia in Calves—1945-1947

TREATMENT	NUMBER OF CASES	RECOVERED	DIED	PER CENT RECOVERED
SULFAMERAZINE	47	40	7	85.1
SULFAMETHAZINE	32	24	8	75.0
A COMBINATION OF PENICILLIN* AND SULFAMERAZINE OR SULFAMETHAZINE	14	12	2**	85.7
TOTAL	93	76	17	81.7

*Only 2 cases treated with penicillin alone. **Two cases that died began receiving penicillin several days after sulfa therapy was begun.

In the older cattle, over 6 months of age, 50 were treated with sulfamerazine and 3 died, a 94 per cent recovery rate. Seventy-four cattle were treated with sulfamethazine and 4 died, a 94.6 per cent recovery rate. Only 5 cows, too small a number to be significant, were treated with a combination of penicillin and sulfamethazine or sulfamerazine, and all recovered.

Thus, in 129 cases of pneumonia in older

cattle, 122 (94.6%) recovered. Of these cases, 119 were diagnosed as the pneumonic type of hemorrhagic septicemia. The other 10 cases were sporadic primary pneumonias. Of the 119 hemorrhagic septicemia cases only 5 died, or a recovery rate

TABLE 2—Treatment of Pneumonia in Adult Cattle—1945-1947

TREATMENT	NUMBER OF CASES	RECOVERED	DIED	PER CENT RECOVERED
SULFAMERAZINE	50	47	3	94.0
SULFAMETHAZINE	74	70	4	94.6
A COMBINATION OF PENICILLIN AND SULFAMERAZINE OR SULFAMETHAZINE.	5	5	0	100.0
TOTAL	129	122	7	94.6

Sulfamerazine was supplied by Sharp and Dohme, Inc. Sulfamethazine was supplied by Lederle Laboratories. Penicillin was supplied by Schenley Laboratories, E. R. Squibb and Sons, Lederle Laboratories, and Merck and Co.

of 95.9 per cent. Two of the 5 cows that died had the disease two and four days before treatment was begun. A very poor prognosis was given at that time. This result of treatment of hemorrhagic septicemia (95.9% recovery) is similar to that obtained by McAuliff,[3] who used only sulfamerazine. Of these 119 cases of shipping fever pneumonia, 77 received hemorrhagic septicemia serum, and of this group 4 (6.2%) died. The rest, 42 cattle, received no serum and of these, 3 (7.2%) died.

DISCUSSION

After tabulating our results, it was desirable to ascertain the effectiveness of treatment with these newer sulfonamides and penicillin as compared with previous methods of treatment. This was done by reviewing the results of the treatment of pneumonia and hemorrhagic septicemia in older cattle observed in the New York State Veterinary College Ambulatory Clinic during the past twenty years (1927-1947), as shown in graph 1. A total of 1,729 cases of pneumonia, including 855 cases of hemorrhagic septicemia pneumonia, were reviewed.

From 1927 to 1937, before the era of sulfonamide therapy, 318 of the hemorrhagic septicemia cases reviewed were treated symptomatically. The recovery rate for this disease in that period was 78.6 per cent. During the next eight-year period, 1937 to 1945, sulfonamide therapy came into general use. During this eight-year period, sulfanilamide was the principal sulfa compound used in treating 347 cases. Occasional cows were treated with sulfathiazole and sulfapyridine. The recovery rate for this period was 90.6 per cent. During the last two years, 1945 and 1946, 190 cases of hemorrhagic septicemia were treated, with a recovery rate of 95.4 per cent. Of these 190 cases, 119 were treated with sulfamerazine, sulfamethazine, and penicillin, with a recovery rate of 95.9 per cent. At the present time, using these newer sulfonamides and penicillin, the losses in cattle due to hemorrhagic septicemia pneumonia, when promptly treated, should be low.

The importance of treating pneumonia as early as possible should be stressed. Prompt recoveries with fewer cases of chronic pneumonia result where early treatment is instituted. For this reason, intravenous sulfonamide therapy is desirable. For example, in one herd affected with shipping fever pneumonia, an 800-lb. grade Jersey cow was apparently normal in the morning, and in the evening her temperature was 108 F., pulse rate 100, and respirations 80 per minute. She showed anorexia, and coughing could easily be induced. Auscultation of the lungs revealed an increased vesicular murmur. The cow was given 50 Gm. of sodium sulfamethazine intravenously in a 25 per cent solution, and 15-Gm. tablets of sulfamethazine were left to be given: one, three times a day, beginning in twelve hours. Twenty-four hours later, the cow's temperature was 100.8 F., her pulse rate 77, and respiration rate 36 per minute. The cow was bright and alert with a good appetite. Treatment of cows or calves with acute pneumonia of three to four days' duration or chronic pneumonia is unsatisfactory.

It was observed by analysis of our results that hemorrhagic septicemia serum is not necessary in acute cases of hemorrhagic septicemia pneumonia being treated with sulfamerazine or sulfamethazine. McAuliff also made this observation. This saving to the farmer is welcome, as the cost of these newer sulfonamides is still high.

In only 2 cases were any toxic reactions observed in the use of these pyrimidines

in treating pneumonia. In one case, an 850-lb. Holstein-Friesian cow was given 50-Gm. doses of sulfamerazine three times daily. This treatment was continued for two days. On the third day hematuria was observed and sulfamerazine therapy was stopped. The cow recovered uneventfully. In this case the dosage was obviously too high. In the second case, 100 cc. of a 25 per cent solution of sodium sulfamethazine was given to an 850-lb. Guernsey cow. About two minutes after the injection was completed, the cow exhibited a severe reaction. The pulse rose from 80 to 160 and the respiration rate from 45 to over 100 per minute. The cow sweated profusely. This reaction lasted about half an hour, and then the cow's condition gradually returned to normal. We have no explanation for this reaction.

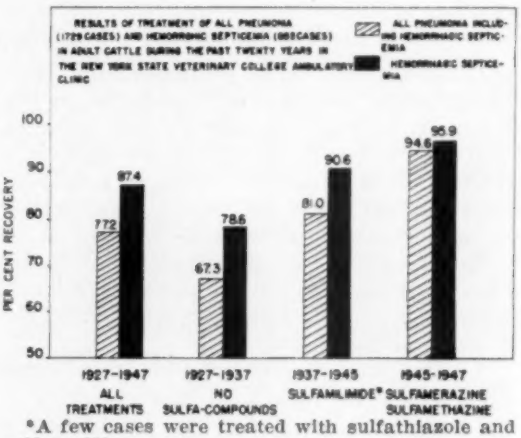
In 58 cases of pneumonia and 92 cases of other diseases treated by the authors with sodium sulfamethazine or sodium sulfamerazine in 5 to 25 per cent solutions, the above described reaction and one other very mild reaction were observed.

The use of penicillin alone or in combination with sulfamerazine or sulfamethazine should be studied further. The added expense and difficulties of treatment probably will limit the use of this method of treatment. However, from our small number of experiments, and also from information gained from practitioners who have used penicillin alone or in combination with these newer sulfonamides, the results have been very encouraging. Adequate dosage of penicillin must be used, as small doses at irregular intervals are of little value and a waste of both time and money.

Treatment of pneumonia in calves with sulfamerazine, sulfamethazine, and penicillin is not as satisfactory as the treatment in older cows. Possibly the reasons for this are that the pneumonic symptoms are not noticed as soon and that calves are more susceptible to a fatal infection. In about 50 per cent of the calves that died, emphysema of the lungs was marked.

Prevention of pneumonia in cattle is an important phase of any large animal practice in the northern part of the United States. In calves we have found the best control methods are those advocated by Udall.[9] These methods consist of isolating calves in small groups, in cold, but dry quarters, free from drafts, and rearing them on nurse cows. These quarters may be open on one side, preferably the south, and in very bad weather a tarpaulin may be used to cover the open side. This method works particularly well in large herds with many calves, where pneumonia is more of a problem than in small herds. We believe that in many herds during the winter months vitamin A and D supplements are of value in improving the calves' resistance to pneumonia. Bacterins and serums for calves have been of some value in certain herds.

Graph 1



*A few cases were treated with sulfathiazole and sulfapyridine.

In older cattle, the use of hemorrhagic septicemia and pulmonary mixed bacterins are of value if used two to four weeks before shipment, or in the fall, in herds that will be exposed to hemorrhagic septicemia during the winter or the following spring.

We have divided one herd of 150 cows, kept in close association with a 100-cow dairy of sale cattle, into four groups. During the past four years, each group has been vaccinated in the fall with a different type and brand of bacterin. The vaccinations have apparently prevented hemorrhagic septicemia in all cows so treated and subsequently exposed to the infection.

In cattle recently shipped or in cows exposed to hemorrhagic septicemia, we routinely use 40 to 50 cc. of hemorrhagic septicemia serum for immediate protection. We prefer not to use bacterins in these cases, as we too frequently have cattle coming down with the disease in seven to ten days where bacterin is used under these questionable circumstances. We ad-

vise farmers in purchasing cattle to vaccinate with serum immediately and to isolate cows for two to three weeks before putting them with their main herd. We would advise those who intend to purchase cattle from October to April to vaccinate their own herds at least two weeks before a purchase is to be made.

CONCLUSIONS

1) Treatment with sulfamerazine, sulfamethazine, and penicillin resulted in the recovery of 94.6 per cent of 129 cases of the pneumonic form of hemorrhagic septicemia in older cattle. This is a definite improvement over the results obtained by using the other sulfonamides.

2) Treatment of 93 calves with the newer pyrimidines (sulfamerazine and sulfamethazine) and penicillin resulted in the recovery of 81.7 per cent.

3) The use of hemorrhagic septicemia serum in acute cases of pneumonia treated with the newer sulfonamides is not necessary.

4) A review of the results of treatment of pneumonia in cattle for the past twenty years, reported by the New York State Veterinary College Ambulatory Clinic, indicates a marked drop in mortality since the use of sulfonamide therapy. At the present time, the mortality in our cases of pneumonia has reached a low point of about 5 per cent.

5) Toxic reactions from sulfamerazine and sulfamethazine, when used in the recommended dosage of ½ to ¾ gr. per pound of body weight daily, were not observed. In 150 cases of pneumonia and other conditions in which the sodium salt of these sulfa drugs was used intravenously, there were only 2 instances where a toxic reaction was noted.

6) A brief discussion of our methods used in preventing pneumonia in calves and older cattle is given.

DISCUSSION

CHAIRMAN CAREY: With cattle high in price, the two drugs that he recommended using are somewhat higher than sulfathiazole. Is there enough difference in the two drugs to warrant the use of those drugs as yet? Will Dr. Roberts make that comparison?

DR. ROBERTS: My personal belief is that the results we get are sufficiently better with these newer sulfonamides than with sulfathiazole and sulfapyridine to recommend their use on valuable animals, animals that appear to be acutely and severely infected, and animals in the very early stage of the disease where the sodium salt can be used with prompt recovery resulting.

CHAIRMAN CAREY: Last year the Committee on Cattle Diseases, of which Dr. Kingman from Wyoming was chairman, sent out a questionnaire in regard to pneumonia in cattle. One question was of much interest to me, "Do you find pneumonia in calves prevalent at weaning time?"

I don't have the percentage of answers that were in the affirmative, but many beef cattle practitioners found these calves were developing pneumonia similar to shipping fever at the time of weaning, probably due to lowered resistance and constant bawling. I had not noted that until recent years.

I think that, in addition, there must be some infection on these farms, where they wean the calves, put them in lots and barns, and have them become infected the same as cattle that had been shipped.

Are there any other questions in regard to pneumonia? In wild beef cattle that are a bit hard to inject with intravenous solution, we have been using a solution of neoprontosil intramuscularly. We make up our own solution by dissolving three 5-gr. neoprontosil tablets to each ounce of water. We give from 40 to 60 cc. intramuscularly in addition to the sulfonamides, but we think it helps.

When an animal urinates twenty minutes or more after intramuscular injection, the urine will be a fiery red. If you have left the premises, the owner will call up all excited, thinking that there is blood in the urine. So, if you do use neoprontosil, you should warn the owner of the animal.

Are there any further questions?

DR. W. A. AITKEN (Merrill, Iowa): I would like to ask if you use this intraperitoneally.

DR. ROBERTS: We have not tried the use of these compounds intraperitoneally, for the reason that we have used mainly 10, 12, and 25 per cent solutions, and we are quite sure that would be rather irritating intraperitoneally. Possibly a low per cent, 2 or 3 per cent, might be tolerated.

Another reason we have not used it, as stated in our paper, is that our cases are principally dairy cattle, and very few beef cattle have been treated, probably less than 5 per cent. For that reason we can use intravenous treatment.

DR. KAISER: Neoprontosil also works very well in influenza in hogs, giving it right into the ham. Give one or two shots, maybe one today and one tomorrow. You will be surprised how some of the severe cases of influenza in swine, practically verging on pneumonia, will snap out of it.

CHAIRMAN CAREY: I will say "Amen" to what Dr. Kaiser said. We use it quite often in swine. It acts rapidly and seems to give very good results. Penicillin alone can also be used to very great advantage.

Dr. Aitken from Merrill, Iowa, asked a question in regard to the intraperitoneal injection. He has a lot of beef cattle up in his section. I know why he likes to give medication intraperitoneally. Supportive treatment in pneumonias, especially in beef cattle, is very important, because sometimes we are not called until the animal is in a very debilitated condition. A 25 per cent dextrose solution can be given intraperitoneally quite successfully and has a lot of benefit, where a 50 per cent solution is just a little too irritating; if you use it, you will find the animal will be in distress for some time until it is absorbed.

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Animals of Bikini

Experimental animals distributed among 22 target ships exposed to the atomic bomb in "Operation Crossroads" at Bikini last year included 176 goats, 157 pigs, 57 guinea pigs, and 3,180 white rats. They were deployed at places on the ships corresponding to the various stations of crews during a naval action. The purpose of the experiment was to study the effect of atomic energy on higher life from medical, industrial, and military angles. The species of animals listed were chosen because each speeches has a different degree of resistance to ionizing radiation, thereby affording a wide range for comparison.

The ships were boarded as soon as they were pronounced safe following the bomb explosions. Autopsies were held on the killed, and the living were removed to previously prepared laboratories for study.

All phases of the effect of atomic bombs, including those dropped on Hiroshima and Nagasaki, are now on record, and therefrom scientists have obtained basic data for evaluating the damage to higher life caused by ionizing radiation. The lesions and symptoms described by two medical observers at Bikini, Navy Officers Tullis and Warren (*J.Am.M.A.*, Aug. 2, 1947), were bloody and tarry diarrhea, respiratory distress, congestion of the small vessels of the lungs, heart, and brain, petechiation and small hematomas, renal hemorrhages and clots, intramuscular hemorrhages, capillary dilatation and permeability, intestinal edema and ulcers, anemia and leucopenia—along with secondary infections of varying severity.

A significant fact noted by Tullis and Warren was that the animals which succumbed to the effects of total body radiation died in the acute phase of the disease, and no deaths due to latent or chronic effects have been recorded to date (over a year after the explosion). Moreover, almost all of the deaths occurred within one month after exposure, and the peak of mortality occurred within two weeks, regardless of species. Apparently, all of these deaths were the result of three factors working singly or in combination: anemia, secondary infection, and/or toxemia associated with the degeneration of tissue.

Of all the destructive phases of the bomb to which the Bikini animals were exposed (air blast, thermal radiation, secondary fire, and ionizing radiation), ionizing radiation caused by far the greatest percentage of mortality.

—*Journal of the American Medical Association*

Hemorrhage of the cortex, medulla, and pelvis of the kidney of a pig exposed to test "Baker"—the shallow, under water explosion.

"Animals of Bikini" may be of more than academic interest in veterinary medicine *some day*. Here, it is but a subject to index for future convenience.

The Rural Veterinary Hospital.— Ervin E. Slatter (OSU '30), Danville, Ill. (*North Am. Vet.*, Nov., 1947), brings up a needed reform in veterinary practice that was urged on several occasions by the JOURNAL, namely, the rural veterinary "work shop" of the future. Slatter cites the case of dystocia in a cow back of the strawstack in zero weather and leaves the rest to the imagination of the experienced country practitioner as to the need of the reform. "Fetch 'em in where such things can be attended to in keeping with modern knowledge and means" is a duty the clinical branch of veterinary medicine owes to the animals and people of the community. The horse and buggy days of veterinary practice should not be prolonged.

Laboratory Diagnosis of Newcastle Disease [Avian Pneumoencephalitis]

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THE IDEAL method of diagnosing any disease is to recover and identify the causative agent. Certainly this is the case with Newcastle disease [avian pneumoencephalitis]. However, there are two recognized serologic methods by which Newcastle disease may also be diagnosed. The diagnosis of the disease by virus isolation in our laboratory during the past two years has not been very successful. In fact, in only a little more than 14 per cent of the total attempts made has virus been recovered. This result could depend upon two factors:

1) Until recently, veterinarians throughout the country have not been thoroughly acquainted with this new disease and consequently, in some instances, have not selected proper material.

2) The samples obtained in many cases were shipped long distances and not under ideal conditions. Often the specimens had undergone advanced decomposition and were unsuitable for inoculation purposes. Of late, however, most veterinarians have overcome the difficulties of differential diagnosis and have been able to select much better specimen material. Moreover, through the application of antibiotic agents to contaminated specimens, little trouble has been experienced in recovering virus from those which were obtained from birds affected with Newcastle disease. In our hands, streptomycin has yielded excellent results in disposing of bacterial contaminants.

At the present time, Newcastle disease has been diagnosed in 42 of the States and the District of Columbia. Obviously, a few properly equipped laboratories cannot handle all the specimens that might be submitted for virus isolation from all of these states. The necessity for adequate laboratory facilities for virus isolation in the various states is evident.

Presented before the Section on Poultry, Eighty-fourth Annual Meeting, American Veterinary Medical Association, Cincinnati, Ohio, Aug. 18-21, 1947.

From the Pathological Division, U. S. Bureau of Animal Industry, Beltsville, Md.

SERUM NEUTRALIZATION TEST

The value of the serum neutralization (SN) test as a diagnostic aid is dependent upon its accuracy in estimating the diagnostic antibody level, upon the reliability of positive findings as an indication of exposure to Newcastle disease virus, and upon the feasibility of application as a routine diagnostic procedure. One measure of the accuracy of the method is the ability to obtain comparable results on repeated tests. In our hands, repeated tests with serum samples of varying titers against the same virus have demonstrated that consistent results may be expected, but that variations of one dilution are occasionally encountered.

In routine work the SN test must be used for flock diagnosis, and the question arises as to whether the neutralization by a composite serum sample of 1,000 embryo m.l.d.'s of the specific virus should be considered as diagnostic. With one exception, we have not as yet encountered neutralizing titers as high as 100 embryo m.l.d.'s in composite samples from flocks with a negative history. In the flocks under our immediate observation where positive diagnosis of Newcastle disease has been made by virus isolation, neutralizing titers of at least 10^4 have been reached.

In obtaining composite serum samples, the possibility arises of diluting positive samples with serum from negative birds to the point where a positive test would not be obtained.

A series of neutralization tests were run using a 10^4 titer serum diluted with varying quantities of negative serum. In these experiments diluting with 9 parts of negative serum failed to lower the titer, and diluting with 19 parts lowered the titer tenfold to the next measurable level. In view of the known high morbidity in Newcastle disease, it is believed that serious error because of dilution with serum from noninfected birds is improbable. In flocks up to 1,000 in number, a composite sample of 10 birds from the group is considered

sufficient for diagnosis. Larger flocks should be treated accordingly.

The following test results are in accord with the above statements: Of 329 serum samples tested, 131 gave SN titers of 10^4 or more, 24 gave SN titers of 10^3, whereas 174 gave titers insufficient for positive diagnostic value. The samples giving negative titers were not accompanied by histories suggestive of Newcastle disease.

TABLE I—Comparison of HI and SN Tests in Rapidity in Rise in Diagnostic Titer in Chickens Infected with Newcastle Disease Virus (Step 1 of Experiment)

Virus	Bird no.	Test	Preëxposure titer	Titers in indicated no. of days after exposure				
				2	4	7	9	11
RI	1	HI	10	10	320	320	320	320
RI	1	SN	0	10^1	10^2	10^3	10^4	10^5
RI	2	HI	10	Unsat.	Unsat.	320	320	320
RI	2	SN	0	10^1	10^3	10^4	10^5	10^5
RI	3	HI	10	10	320	320	320	320
RI	3	SN	0	0	10^2	10^4	10^5	10^5
Calif.	4	HI	5	0	320	320	320	320
Calif.	4	SN	1	1	10^2	10^2	10^4	10^4
Calif.	5	HI	5	10	10	Bird dead	..	..
Calif.	5	SN	1	1	1	Bird dead	..	..
Calif.	6	HI	5	10	320	320	320	320
Calif.	6	SN	1	1	10^2	10^3	10^4	10^5

RI = Birds received 1,000,000 embryo m.l.d.'s of the Rhode Island strain of Newcastle disease virus intravenously. Calif. = Birds received 10,000,000 embryo m.l.d.'s of the California strain of Newcastle disease virus intravenously. SN = Serum neutralization. HI = Hemagglutination-inhibition.

Comparison in Appearance of Diagnostic Titer as Determined by the HI and SN Tests

The need and desirability of using only serologic procedures for the diagnosis of Newcastle disease are obvious in many instances, and the ultimate remedial procedures may, to a great extent, be dependent upon a rapid method of diagnosis. Thus, the question arises as to which is the more rapid, the serum neutralization (SN) or hemagglutination-inhibition (HI) test. Accordingly, in order to compare the rapidity of the appearance of diagnostic hemagglutination-inhibition titer and neutralizing antibody titer in the blood stream of chickens infected with Newcastle disease virus, the following experiment was conducted: Chickens 15 to 17 weeks of age were selected and preëxposure blood samples were drawn from each. These preëxposure serum samples failed to yield significant levels in titer by either the HI or SN method of diagnosis. In fact, not one of the birds showed more than a 10 HI titer; and not one showed more than a 10^1 SN titer. Each bird was then injected intravenously with Newcastle disease virus and bled from the heart two days after injection and every two to three days thereafter. The serum from each sample was tested by both the HI and SN methods until a significant and diagnostic titer by either of the methods was obtained. In 2 instances, the birds died before diagnostic levels were obtained by either method, and in each case the tests had been made for four days postexposure. Diagnostic titers in this experiment are accepted as 80 or more for the HI test and 10^3 or more for the SN test.

This experiment was conducted in three steps:

Step 1 (table 1).—Three chickens were given intravenously 10 million embryo m.l.d.'s of the California strain of Newcastle disease virus, and 3 were given 1 million embryo m.l.d.'s of the Rhode Island strain of Newcastle disease virus. On the fourth day postexposure, 4 of the 6 birds showed HI titers of significant or diagnostic value. One of the 4 also showed an SN titer of 10^3. One, giving unsatisfactory results on the HI test, gave a 10^2 on the SN test. The 1 remaining bird failed to show a significant titer by either method at this time. The bird showing an insignificant SN level on the fourth day, yet a significant HI titer, did not show a diagnostic SN titer until the ninth day postexposure. Thus, in this instance, the HI test was more successful from a diagnostic point of view than was the SN test.

Step 2 (table 2).—Six birds were each injected intravenously with 1 million embryo m.l.d.'s of the California strain of Newcastle disease virus. Five days postexposure each of

the birds showed diagnostic titers by both the HI and SN methods.

Step 3 (table 3).—Eleven chickens were each injected intravenously with 10,000 embryo m.l.d.'s of the California strain of the Newcastle disease virus. Four days postexposure, 2 of the 11 showed significant HI titers, and no diagnostic SN titers were obtained. One bird died following bleeding on the fourth day. Six days postexposure the 10 remaining birds each showed diagnostic HI titers, whereas only 7 of them showed diagnostic SN titers. The 3 birds failing to show diagnostic SN titers at this time did show diagnostic SN titers on the eighth day.

From the three tests in this experiment, it can be seen that a diagnostic HI titer was obtained from more of the test birds at an average earlier time than was obtained by the SN method of diagnosis. Apparently, there was some delay in appearance of diagnostic titers by either method in test 3, and it seems that the lower embryo m.l.d. exposure with this group might be the deciding factor. Some conjecture may arise as to the possible parallel of these tests with what one might expect to encounter in natural outbreaks of the disease. Dr. P. P. Levine, of the New York State Veterinary College at Ithaca, stated at a meeting in Washington, D. C., in May of this year that he had had occasion to test a number of birds from a natural outbreak of Newcastle disease. In this instance, also, the HI diagnostic titer was obtained earlier than was the diagnostic SN titer. This might hold true in most natural outbreaks of the disease.

RELIABILITY OF SEROLOGIC TESTS

The reliability of the two recognized serologic methods naturally is of paramount importance in the successful recognition and control of the disease. It is not probable that all laboratories in the United States—federal, state, institutional, or others—charged with the responsibility of successful diagnosis and control of livestock and poultry diseases within their particular sphere have the necessary material and personnel to delve into the problems at hand as thoroughly as might be desired. Consequently, it was deemed important to determine, if possible, the relative merits of the HI and SN methods for the diagnosis of Newcastle disease. With this in view, 203 serum samples were tested by both methods in the Pathological Division laboratory. Most of these samples were received from the various states submitting suspected serums for diagnosis during the time covered by this report.

Based on a diagnostic titer of 80 or more for the HI test and 10^3 or more for the SN test, the following results were obtained: Of the 203 samples tested, 103 (51%) were positive to both tests; 85 (42%) were negative to both tests; two were negative to the HI and positive to the SN test; three were positive to the HI and negative to the SN test. Unsatisfactory results on the HI test were accompanied by negative results to the SN test on eight tests, and positive results in only two instances.

These results would indicate that the diagnosis of Newcastle disease by the HI test, if conducted with care, is equally accurate and reliable as the SN test. It should be remembered also that the results of the SN method of diagnosis are at times not easily explained.

TABLE 2—Comparison of HI and SN Tests in Rapidity in Rise in Diagnostic Titer in Chickens Infected with Newcastle Disease Virus (Step 2 of Experiment)

Virus	Bird no.	Test	Preëxposure titer	Titers in indicated no. of days after exposure			
				2	5	7	9
Calif.	1	HI	10	10	320	320	320
Calif.	1	SN	0	0	10^4	10^4	10^5
Calif.	2	HI	10	5	320	...	...
Calif.	2	SN	0	1	10^4	...	...
Calif.	3	HI	5	10	320	320	320
Calif.	3	SN	0	1	10^4	...	10^5
Calif.	4	HI	5	5	320	320	320
Calif.	4	SN	0	0	10^3	10^4	10^5
Calif.	5	HI	5	5	320	320	320
Calif.	5	SN	0	0	10^3	10^4	10^5
Calif.	6	HI	10	40	320	...	...
Calif.	6	SN	1	10^2	10^3	...	...

SN = Serum neutralization. HI = Hemagglutination-inhibition. All birds received 1,000,000 embryo m.l.d.'s of the California strain of Newcastle disease virus intravenously.

At a meeting of poultry pathologists at Baltimore, Md., in November, 1946, to approve a coördinated research program on Newcastle disease, it was agreed that if the diagnosis of the disease in the laboratories located in the various states was to depend largely on the HI and SN tests, it should be determined if the test results could be repeated with accuracy. With this in mind, there were prepared in the Pathological Division laboratory of the Bureau of Animal Industry seven samples of chicken serum with SN titers ranging from 0 to 10^6, and with HI titers ranging from 0 to 320. Virus with which the tests were to be made was also prepared in the same laboratory. These materials were forwarded to a number of laboratories engaged in the diagnosis of Newcastle disease at that time. Each participating laboratory conducted the tests as described in the outlines distributed by the Bureau of Animal Industry under date of Aug. 15, 1946, and Oct. 21, 1946. Seven laboratories conducted the SN test on these samples. In no instance was a diagnostic, or 10^3, titer obtained on the samples of 0 and 10^1 titer. With the samples of 10^3 titer, there was agreement so far as the diagnostic level was concerned by six of the seven laboratories. One laboratory reported this as a 10^1 titer. On the samples with 10^5 and 10^6 titers, there was complete agreement as to the diagnostic titer in all cases. However, in one instance, the serum of 10^5 was reported as 10^3. Another laboratory reported the 10^6 sample as low as 10^3.

Nine laboratories reported HI results on these seven serum samples. Of these, five obtained comparable results. Although these are less satisfactory than the SN results, it is believed that the different results reported by some were due to failures in technique, a difficulty which could be corrected. In other words, it is believed there is nothing inherently wrong with the test. In view of the fact that not all these laboratories were regularly conducting one or the other of these tests as a means of diagnosing Newcastle disease, it was felt that in general these results were very good. Furthermore, since this work was done, these laboratories, as well as others which have subsequently been equipped for conducting these tests, have reported excellent results by the use of these methods of diagnosis of Newcastle disease.

Even though Newcastle disease has been recognized in the United States for only the past few years, and many veterinarians throughout the country were not acquainted with the disease, the progress made by the men in detecting the disease clinically has been very good. This is substantiated by the fact that a majority of samples received at our laboratory have been confirmed as

TABLE 3—Comparison of HI and SN Tests in Rapidity in Rise in Diagnostic Titer in Chickens Infected with Newcastle Disease Virus (Step 3 of Experiment)

Virus	Bird no.	Test	Preëxposure titer	Titers in indicated no. of days after exposure				
				2	4	6	8	10
Calif.	1	HI	5	10	10	320	320	320
Calif.	1	SN	0	1	1	10^2	10^4	10^5
Calif.	2	HI	5	10	5	Bird dead 4th day after bleeding		
Calif.	2	SN	0	1	1			
Calif.	3	HI	5	10	20	320	320	...
Calif.	3	SN	0	1	10^1	10^4	10^4	10^5
Calif.	4	HI	5	10	160	320	320	320
Calif.	4	SN	0	10^1	1	10^4	10^4	...
Calif.	5	HI	5	10	0	320	320	320
Calif.	5	SN	0	1	1	10^4	10^4	10^5
Calif.	6	HI	10	40	20	320	320	320
Calif.	6	SN	0	1	1	10^2	10^4	10^5
Calif.	7	HI	5	10	5	320	320	320
Calif.	7	SN	0	10^1	1	10^2	10^4	10^4
Calif.	8	HI	5	10	5	320	320	320
Calif.	8	SN	1	10^1	1	10^2	10^4	10^5
Calif.	9	HI	5	10	80	320	320	320
Calif.	9	SN	1	1	1	10^2	10^4	10^5
Calif.	10	HI	5	10	20	320	320	320
Calif.	10	SN	0	10^1	10^1	10^2	10^4	10^5
Calif.	11	HI	5	5	10	320	320	320
Calif.	11	SN	0	1	1	10^2	10^4	10^5

All birds received 10,000 embryo m.l.d.'s of the California strain of Newcastle disease virus intravenously. SN = Serum neutralization. HI = Hemagglutination-inhibition.

coming from flocks infected with Newcastle disease.

SUMMARY

The successful diagnosis of Newcastle disease [avian pneumoencephalitis] by virus isolation depends to a large extent on adequate laboratory facilities within the area concerned. There has also been discussed the three laboratory methods of diagnosis of Newcastle disease. Results of comparative tests of the HI and SN methods of diagnosis show the HI method to be practicable for the diagnosis of Newcastle disease and to give concordant results with the SN method. The diagnostic HI titer generally appears earlier than does a diagnostic SN titer. Composite serum samples showing ability to neutralize 1,000 embryo m.l.d.'s of Newcastle disease virus should be regarded as positive evidence of flock exposure to Newcastle disease virus. Results of the HI and SN tests conducted by a number of laboratories, including the Pathological Division laboratory of the Bureau of Animal Industry, showed satisfactory agreement on the SN test, but results of the HI tests were less satisfactory.

Knowledge of Streptomycin in Tuberculosis Taking Form

Thanks to the preliminary work on streptomycin in tuberculosis by W. H. Feldman, H. C. Hinshaw, and others, implemented with extensive trials on human patients by the Veterans Administration, the Army, and the Navy, the Council on Pharmacy and Chemistry of the American Medical Association (*J. Am. M. A.*, Nov. 8, 1947: 634-641) felt justified in publishing a report on 900 treated patients, 543 of whom had completed treatment by May 1, 1947. Suitable cases were selected for the study, the course of the tuberculous process was studied by means of x-rays, and toxicity was determined by aural, hematologic, and renal observations. The drug was injected intramuscularly at the rate of 1.8 Gm. a day, given in 0.3-Gm. doses every four hours (around the clock) for 120 days.

Summed up, Hinshaw's report to the American Trudeau Society (1947) to the effect that streptomycin is a useful adjunct in the treatment of tuberculosis was pronounced "an understatement," since in these trials important results were obtained in tuberculous meningitis, miliary tuberculosis of the lungs, tuberculous sinuses, and ulcerations of the tracheobronchial tree. Results on urogenital tuberculosis were negative. Quoting the final conclusion: "The slight and not entirely safe crutch provided by streptomycin to a limited section of the tuberculous may be replaced by a stronger instrument or a new pair of legs for the entire group."

Penicillin Cures Case of Jumpy Jaw

A case reported by E. F. Lewis, M.R.C.V.S. (*Vet. Rec.*, Sept. 6, 1947), is unique in having responded to penicillin. The whole left branch of the mandible was involved, two of its molars displaced, mastication difficult, and general condition declining. The loose teeth were extracted. One million units of penicillin suspended in oil and wax were injected at eight sites, one half that quantity in twenty-four hours, and one half again in four days. In four months the jaw was restored to normal.

The Dose of Benzadryl and Its Indications in Animals

The dose of the sensational drug, benzadryl hydrochloride, and its clinical uses in veterinary medicine remain to be established although its therapeutics in human medicine has gained considerable importance in a variety of ailments having comparable manifestation in animals. Among them are urticaria, heaves, founder, generalized pruritus, neurodermatitis, atopic eczema, blood-transfusion reaction, and various allergies. The pronounced benefits derived from benzadryl in bronchial and cardiac asthma, hay fever, food and drug allergies (penicillin, sulfonamides, insulin, aspirin, tetanus antitoxin), and the predictable results that may be obtained in the above named maladies of the veterinary clinic, post the veterinarians' obligation in this connection.

The oral dose of benzadryl hydrochloride for man appears to range from 50 to 300 mg. daily, in capsules. In these doses, the drug is antispasmodic, antihistaminic, antiallergic, and sedative.

Methionine and cystine are the only sulfur-containing amino acids.

Intradermal Foot-and-Mouth Disease Vaccine

Results Obtained from the First Million Head of Cattle Vaccinated

CARLOS T. ROSENBUSCH, D.V.M., Ph.D., ANDRES DECAMPS, M.V., and NICOLAS GELORMINI, M.V.

Buenos Aires, Argentina

A NEW vaccine has been developed by the Research Section of the Institute de Biologia Experimental of Buenos Aires, Argentina. A preliminary report on this vaccine was given at the August, 1946, meeting of the Associación Medico Veterinaria Argentina.

This vaccine is alum-adsorbed, formol-killed and has a high virus concentration (5%). The virus used in its preparation is obtained from fresh tongue lesions of artificially infected susceptible cattle, and it includes the three main types isolated in the Argentine Republic.

Systematic bovine cross immunity studies on the viruses isolated from different epizoötics as well as from varied geographic zones of the Argentine have permitted us to identify the presence of genetic variants approaching the three main standard types described in the literature. In no case was it possible for us to identify a genetically pure virus as they all included antigenic fractions for at least two types of virus. The most common variation between viruses consisted in percentage differences between the antigenic fractions.

These results were obtained through repeated cross immunity tests on different strains of the three main types. For that purpose the purest strains were used. Of the 31 strains of virus studied during the year 1946-1947, eight corresponded mainly to type O; seven to type C, and five to type A, while eleven could not be classified under any type, since they proved immunologically related to all three of the standard types.

This polygenetic characteristic was carefully studied and demonstrated not to be due to a mixture of viruses by "vital filtration" through series of susceptible calves or guinea pigs. The predominant virus type isolated through the 1946-1947 epizoötic period were of the C and O types. The presence of the A type was found predominantly in the eastern provinces which border on Brazil and Uruguay and which are isolated from the rest of the country by the large Paraná river. The epizoötic in that zone appeared through a period of time, while it occurred almost enzoötically through the whole year in the larger cattle regions of the Pampas, involving in some places as many as five consecutive outbreaks of the disease.

The strains used in the vaccine were chosen to include several strains of each standard type. These strains were especially selected for their intradermic immunizing capacity, quick action, and long lasting effects.

The alum used in the vaccine is prepared from commercial sodium alum of low iron content which, after various purification steps and further treatment with ammonia, shows unusually high adsorbing capacity, with titers above 1:100, as measured by the neutral red adsorption test.

The buffer used is prepared from glycocoll, is alkaline and highly stable. The vaccine is heat treated at 25 C. for two days, then culture tested in order to insure bacteriologic sterility and later controlled as to the presence of live virus by freezing-elution methods, followed by massive intradermolingual inoculations into susceptible calves. The inoculated animals should not show any symptoms of the disease at any time.

Each batch is tested to establish its immunizing value by intradermic inoculations of 2 cc. into susceptible animals. Seven days later, the animals are tested by tongue scarification (friction) with an infected burlap or cloth. Other animals are tested on the fourteenth day by massive intralingual inoculations with the original viruses.

If the vaccine has been well applied, as judged by the formation and perduration of a large sized nodule at the inoculation site, none of the animals should become sick

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or develop the slightest tongue lesion, while all, or most, of the unvaccinated controls should become sick.

A great deal of importance has been placed on the application of the vaccine, since it involved the generalized adoption of a new and somewhat complex technique. In addition, the thickness of the individual skins and the varying working facilities (installations) required that specific instructions be given. Following are the conclusions after a prolonged study of the problem:

The vaccine should be applied intradermically in the dose of 2 cc. after careful shaving and disinfection of the vaccination area. For that purpose appropriate 2-cc. syringes should be used with needles 5 to 7 mm. long and with a gauge of 0.7 to 0.9 mm.

The inoculation site should be preferably 3 to 4 finger breadths behind the base of the ear, and in bulls between the base of the ear and the poll. In animals with a very thin skin, the inoculation site should be modified, choosing for that purpose the side of the face (masseter region).

These places have been selected through countless trials and are based on the longest perduration of the nodule which, according to our own experience, should last at least a year. The selection of other inoculation points is not advised on the basis of the more irregular results in the perduration of the original nodule due to such factors as tenseness of the skin, sensitiveness of the animal (scratching), and possibility of infections.

The vaccine should be injected carefully in order to insure its thorough intradermic application. For that purpose the needle should not be inserted too superficially or too deep in the skin, because either of the two procedures is dangerous, causing the formation of abscesses by compression necrosis when too superficial, which later open and permit the loss of part of the vaccine, or by the passage of part of the vaccine to the subcutaneous tissues, which is equally ineffective.

A good application of the vaccine is assured by the appearance and permanence of a nodule, the size of a "half-nut". If the vaccine does not produce the characteristic nodule, or if an abscess should be formed as the result of an inadequate technique, the animals should be revaccinated.

Our observations point out that the presence and length of the immunity is in direct relation to the perduration of a large nodule.

The immunity produced by the vaccine appears within the first six days and is definitely established by the fourteenth day. The length of the complete polyvalent immunity is of six months. After the sixth month, the immunity is still evident toward some viruses while it appears definitely reduced toward others. Experimental immunity tests, performed at varying intervals (3, 6, 9, and 12 months) by tongue scarification methods with the different types of virus, demonstrated a complete protection towards our three standard types on the third- and sixth-month tests and a complete protection towards two types on the ninth- and twelfth-month tests. New virus strains are being tested to obtain a complete polyvalent immunity which should last for twelve months.

The statistical results obtained by compilation of data gathered throughout the first year of vaccination, including 2 million head of cattle, of which close to 1 million reached the six-month immunity period, demonstrated highly satisfactory results, even though it involved the wholesale adoption of a new and somewhat complex method of application, of which an appreciable amount has been applied by laymen due to the shortage of veterinarians.

Notwithstanding these difficulties and the fact that in most cases the animals were repeatedly in direct contact with the disease through the intense enzoötic which reigned in the country during that period, there were only 7 per cent partial or total failures of all the lots vaccinated in that time.

These failures included 5 per cent due to incorrect application as judged by visual inspections made by our veterinarians. The remaining 2 per cent were caused by possible deficiencies in the vaccine either in its preparation or maintenance because of the delicate nature of the product. The vaccine has an effective duration of thirty days when maintained at a temperature of 3 to 10 C. If maintained at higher temperatures the duration is shortened, depending on the degree of exposure.

The success obtained by the use of this method has encouraged us to test it in other countries (Chile, Uruguay, Peru, Paraguay,

and Bolivia), amounting to a total of almost 100,000 animals. The results obtained in these countries have agreed with those of the Argentine.

The same vaccine has been applied to about 100,000 sheep with excellent results. The only difficulties observed were related to cases of incorrect application.

The dose of the vaccine for sheep is 1 cc. The inoculation site recommended is the side of the face (below the eye), the elbow, or the medial face of the thigh, choosing always regions free of wool.

This vaccine has not given the desired results in swine. At present we are carrying on research on a different vaccine prepared solely with swine virus strains. The preliminary results obtained are highly promising.

Further large scale experiments have been performed through the last six months on a new vaccine based on a predominance of quick-acting virus strains which has enabled us to obtain a complete polyvalent quick-acting immunity within the first twenty-four to thirty-six hours of the application. The immunity which is established is of shorter duration (3 to 4 months).

This vaccine is enabling us at present to obtain the desired results in livestock fairs, at weaning, in transports or livestock movements, or even to limit beginning outbreaks of the disease, providing that not many animals are incubating the virus.

Very good results have been obtained in large lots of livestock, building a vaccination ring or barrier immediately around the disease outbreak. These results could not be obtained with the regular vaccine because it requires generally fourteen days for the establishment of complete immunity.

Comparative field immunity tests between the subcutaneous (Waldmann or Silvio Torres types) and the intradermic vaccine have demonstrated that the immunity established in the case of the subcutaneous vaccines is generally slower in its onset and of a shorter duration. In addition, the immunity effect in young animals is much greater with the intradermic vaccine, provided there is a perfect nodule perduration.

The immunity produced by the intradermic vaccine is strictly of a tissue type and not humoral, as in the case of the subcutaneous vaccine. This is proved by the complete lack of formation of blood antibodies as tested by serum-virus neutralization tests.

Concluding, this new vaccine, the intradermic vaccine, because of its decidedly lower cost, quicker immunity effect, stronger action, and longer duration should supplant in the very near future all the present-day subcutaneous vaccines.

Human Epilepsy and Canine Hysteria Related

In an article describing the part played by chemically treated wheat flour in the etiology of human epilepsy, Silver, Johnson, Kark, Klein, and Zevin (*J.Am.M.A.* Nov. 22, 1947: 757-760) make a strong case against the use of gaseous nitrogen trichloride to make white bread fine, silky, and more appealing to the palate, for, when fed to dogs it causes "canine epilepsy", the name preferred for "running fits," "canine hysteria," or "fright disease," of veterinary literature, which bears a close resemblance to idiopathic epilepsy of the human being. Electroencephalograms of experimentally stricken dogs justified the authors to use the word "epilepsy" for the canine ailment. In short, some of the white flour of the United States and a few European countries is toxic. Instead of being the staff of life, it is the staff of a grave, cerebral disorder manifested in man and dogs. The investigational work of Melnick and Cogwell and of Arnold and Elvehjem in this country and that of Johnson and Kark *et al.* in England is cited, and the references where the curious may read the details are given. The relation of farinaceous food to the disease we call canine hysteria is well known in the small animal clinic, but its definite connection with the human epileptic is news.

Foot-Rot Prevention.—Dr. A. C. Rosenberger (WASH '08), senior field veterinarian of the California State Department of Agriculture, takes care of the foot-rot problem in sheep by automatic immersion of their feet in copper sulfate solution at a specially constructed salt lick. The sheep approach the salt trough by walking over wooden tanks 10 ft. wide and a few inches deep. When the wet, or foot-rot, season arrives, water is first put into the shallow tanks and later the copper solution. For a short time the sheep must be guarded against drinking the solution.—*From the California Wool Grower.*

Nervous Ailments of Dogs

CARL F. SCHLOTTHAUER, D.V.M.
Rochester, Minnesota

DISEASES of the nervous system are among the oldest ailments known to occur in man and lower animals. They are of frequent occurrence in the dog. This species of animal is subject to nearly all of the organic nervous diseases and some of the psychic disturbances seen in man.

Nervous diseases are manifested by various psychic disturbances, fits, convulsions, incoördination of movement, paralysis, functional disorders, and organic changes. Fits, convulsions, and paralysis are the most frequent nervous symptoms observed in dogs. However, fits are not specific for nervous diseases alone; they may also occur in association with other ailments.

The diagnosis and differentiation of nervous diseases frequently is difficult and in some instances is impossible, because the symptoms manifested indicate only their site of origin and not their cause. Various agents or lesions may produce similar symptoms if they affect the same tissues or nerve cells. The various anatomic units of the nervous system are functionally interrelated but each has a specific function, and disease restricted to any one of these units usually gives rise to certain definite symptoms. Diseases which affect the cerebrum produce various psychic disturbances, fits, convulsions, and incoördination of movements, whereas diseases which are restricted to the cerebellum or medulla produce only motor disturbances. But a lesion in either the cerebellum or medulla, if it obstructs the flow of the cerebrospinal fluid, may also produce symptoms of cerebral disease. Ataxia, torticollis, and rolling movements are common symptoms of cerebellar disease, and weakness or paralysis of the muscles of mastication and deglutition are the most frequent symptoms observed when the disease affects only the medulla. Diseases of the medulla may, however, also cause various other motor disturbances, and irregular pulse, Cheyne-Stokes respiration, and vomiting.

Diseases which are restricted to the spinal cord may cause various motor and sensory disturbances, certain functional disorders, and deformities. Weakness, paralysis, pain, and urinary incontinence are the most frequent symptoms of spinal cord disease observed in dogs.

Diseases of the meninges commonly produce severe pain. Inflammation of the meninges of the brain usually produces elevation of the head and rigidity of the muscles of the neck; hyperesthesia of the skin and muscles of the head and neck and, not infrequently, fits and convulsions. When the disease present is restricted to the meninges of the spinal cord, there usually is hyperesthesia of the skin and muscles of the body and, because of the pain associated with the condition, the animal tends to hold the body rigid. An affected animal usually resents being handled. If the meningitis persists and becomes chronic, the meninges tend to become thickened and osseous plaques may develop in them. This condition commonly produces persistent pain and has been confused clinically with rheumatism.

Diseases of the peripheral nervous system produce functional and sensory disturbances. The functional disturbances may affect the motor, secretory, or trophic function of an organ or a part. In dogs various symptoms attributable to diseases of the peripheral nerves may develop, but peripheral neuritis, atrophy of muscles, and lameness are the most frequent symptoms observed.

The etiologic agents in nervous diseases are various. Neurotropic viruses probably are the most frequent cause of encephalitis and myelitis in dogs. Lentz,[1] in discussing the etiology of encephalitis in dogs, stated that Green mentioned three viruses other than the virus of rabies which may cause encephalitis in this species of animals. They are (1) the virus of canine distemper, (2) the virus of fox encephalitis, and (3) a virus independent of the first two. The latter has also been suggested by other investigators. Such a virus has been studied by Beckman and Torrey[2] and by Cordy.[3] One must also add to this

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group of viruses the virus of western type equine encephalomyelitis, because it was demonstrated experimentally by Schlotthauer[4] that young dogs are susceptible to the virus of western type equine encephalomyelitis when they are inoculated intracranially and intracutaneously with the virus. The virus of lymphocytic choriomeningitis, too, is frequently present in dogs. It alone apparently causes no demonstrable disease in this species of animal, but when it is present in association with other pathogenic organisms it may produce further effects.

Bacterial organisms, too, produce various nervous diseases in animals. Lockhart and Johnson[5] found certain streptococci to be present quite constantly in the cerebrospinal fluid and brain of dogs affected with post-distemper encephalitis. Organisms of the genuses Streptococcus, Salmonella, Listerella, and Pasteurella have been isolated from the tissues of the nervous system. I isolated *Clostridium chauvoei* from the brain of a calf that manifested only nervous symptoms. It is possible that it and some of the other organisms mentioned may occasionally cause nervous disease in dogs.

Certain parasites, hookworms and whipworms in particular, have also been shown in some instances to cause fits in dogs, and some of the ticks are known to cause paralysis. The mechanism by which these parasites produce the nervous symptoms is not known. The paralysis caused by ticks apparently is produced by a toxin which they elaborate, because the symptoms disappear after their removal. Ear mites have been shown to cause fits in cats. They probably do this by causing inflammation which extends to the meninges or by irritation of the tympanic membrane.

Various organic and inorganic substances such as strychnine, insulin, metrazol (pentamethylenetetrazol), urea, lead, and arsenic may produce nervous symptoms when present in excess. Arsenic and lead are capable also of producing lesions in the nervous system.

The diet has long been regarded as being an important etiologic factor in the development of hysteria and fits in dogs. It has been shown experimentally that certain diets will produce these symptoms. But the mechanism by which the diet produces these symptoms is not known in all instances. The symptoms apparently in some instances are caused by a deficiency of certain essential amino acids or vitamins. But in other instances the symptoms seem to be caused by some toxic substance included in the diet.

It has been observed that certain commercially prepared dry dog foods tend to produce fits in dogs. In 1937 Melnick and Cowgill[6] noted the occurrence of fits in dogs that received a diet containing gliadin. This and various other substances have since been shown to cause nervous symptoms in dogs.

Patton[7] in 1939 observed the occurrence of fits in dogs receiving a diet that was deficient in thiamine. Administration of thiamine alone to these animals was sufficient to prevent the occurrence of the fits. This observation, however, has not been confirmed in other laboratories. However, Green, Carlson, and Evans[8] in 1941 demonstrated that so-called Chastek paralysis in foxes was due to thiamine deficiency. It could be produced in foxes by feeding them a diet containing certain kinds of raw fish. It was determined that something in the fish tended to destroy the thiamine in the diet. This observation was confirmed later by Spitzer, Coombes, Elvehjem, and Wisnicky.[9]

Arnold and Elvehjem[10] in 1939 observed the occurrence of fits in dogs that were given a dried food which had been subjected to abnormally high temperatures. The addition of raw casein to this diet effectively prevented the occurrence of the symptoms. This tended to indicate that the fits were due to a deficiency of some substance, possibly one or more of the essential amino acids which may have been destroyed or altered by the heating process.

Wagner and Elvehjem[11] in 1944 presented data to show that the inclusion of 10 per cent or more of wheat gluten in an otherwise adequate diet produced fits consistently when fed to young dogs. When the diet fed contained 10 per cent of wheat gluten, fits developed in twenty-two days, and when the wheat gluten content was as much as 25 per cent, the fits occurred as early as seven days. This diet was not toxic for the chick, rat, mouse, guinea pig, or monkey. The authors also observed the occurrence of canine hysteria of the nutritional type in dogs receiving certain commercially prepared baked dog foods. Some toxic factor present in wheat gluten is thought to be the cause of the symptoms noted. It was noted, too, that dogs tend

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Diseases of the meninges commonly produce severe pain. Inflammation of the meninges of the brain usually produces elevation of the head and rigidity of the muscles of the neck; hyperesthesia of the skin and muscles of the head and neck and, not infrequently, fits and convulsions. When the disease present is restricted to the meninges of the spinal cord, there usually is hyperesthesia of the skin and muscles of the body and, because of the pain associated with the condition, the animal tends to hold the body rigid. An affected animal usually resents being handled. If the meningitis persists and becomes chronic, the meninges tend to become thickened and osseous plaques may develop in them. This condition commonly produces persistent pain and has been confused clinically with rheumatism.

Diseases of the peripheral nervous system produce functional and sensory disturbances. The functional disturbances may affect the motor, secretory, or trophic function of an organ or a part. In dogs various symptoms attributable to diseases of the peripheral nerves may develop, but peripheral neuritis, atrophy of muscles, and lameness are the most frequent symptoms observed.

The etiologic agents in nervous diseases are various. Neurotropic viruses probably are the most frequent cause of encephalitis and myelitis in dogs. Lentz,[1] in discussing the etiology of encephalitis in dogs, stated that Green mentioned three viruses other than the virus of rabies which may cause encephalitis in this species of animals. They are (1) the virus of canine distemper, (2) the virus of fox encephalitis, and (3) a virus independent of the first two. The latter has also been suggested by other investigators. Such a virus has been studied by Beckman and Torrey[2] and by Cordy.[3] One must also add to this

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group of viruses the virus of western type equine encephalomyelitis, because it was demonstrated experimentally by Schlotthauer[4] that young dogs are susceptible to the virus of western type equine encephalomyelitis when they are inoculated intracranially and intracutaneously with the virus. The virus of lymphocytic choriomeningitis, too, is frequently present in dogs. It alone apparently causes no demonstrable disease in this species of animal, but when it is present in association with other pathogenic organisms it may produce further effects.

Bacterial organisms, too, produce various nervous diseases in animals. Lockhart and Johnson[5] found certain streptococci to be present quite constantly in the cerebrospinal fluid and brain of dogs affected with post-distemper encephalitis. Organisms of the genuses Streptococcus, Salmonella, Listerella, and Pasteurella have been isolated from the tissues of the nervous system. I isolated *Clostridium chauvoei* from the brain of a calf that manifested only nervous symptoms. It is possible that it and some of the other organisms mentioned may occasionally cause nervous disease in dogs.

Certain parasites, hookworms and whipworms in particular, have also been shown in some instances to cause fits in dogs, and some of the ticks are known to cause paralysis. The mechanism by which these parasites produce the nervous symptoms is not known. The paralysis caused by ticks apparently is produced by a toxin which they elaborate, because the symptoms disappear after their removal. Ear mites have been shown to cause fits in cats. They probably do this by causing inflammation which extends to the meninges or by irritation of the tympanic membrane.

Various organic and inorganic substances such as strychnine, insulin, metrazol (pentamethylenetetrazol), urea, lead, and arsenic may produce nervous symptoms when present in excess. Arsenic and lead are capable also of producing lesions in the nervous system.

The diet has long been regarded as being an important etiologic factor in the development of hysteria and fits in dogs. It has been shown experimentally that certain diets will produce these symptoms. But the mechanism by which the diet produces these symptoms is not known in all instances. The symptoms apparently in some instances are caused by a deficiency of certain essential amino acids or vitamins. But in other instances the symptoms seem to be caused by some toxic substance included in the diet.

It has been observed that certain commercially prepared dry dog foods tend to produce fits in dogs. In 1937 Melnick and Cowgill[6] noted the occurrence of fits in dogs that received a diet containing gliadin. This and various other substances have since been shown to cause nervous symptoms in dogs.

Patton[7] in 1939 observed the occurrence of fits in dogs receiving a diet that was deficient in thiamine. Administration of thiamine alone to these animals was sufficient to prevent the occurrence of the fits. This observation, however, has not been confirmed in other laboratories. However, Green, Carlson, and Evans[8] in 1941 demonstrated that so-called Chastek paralysis in foxes was due to thiamine deficiency. It could be produced in foxes by feeding them a diet containing certain kinds of raw fish. It was determined that something in the fish tended to destroy the thiamine in the diet. This observation was confirmed later by Spitzer, Coombes, Elvehjem, and Wisnicky.[9]

Arnold and Elvehjem[10] in 1939 observed the occurrence of fits in dogs that were given a dried food which had been subjected to abnormally high temperatures. The addition of raw casein to this diet effectively prevented the occurrence of the symptoms. This tended to indicate that the fits were due to a deficiency of some substance, possibly one or more of the essential amino acids which may have been destroyed or altered by the heating process.

Wagner and Elvehjem[11] in 1944 presented data to show that the inclusion of 10 per cent or more of wheat gluten in an otherwise adequate diet produced fits consistently when fed to young dogs. When the diet fed contained 10 per cent of wheat gluten, fits developed in twenty-two days, and when the wheat gluten content was as much as 25 per cent, the fits occurred as early as seven days. This diet was not toxic for the chick, rat, mouse, guinea pig, or monkey. The authors also observed the occurrence of canine hysteria of the nutritional type in dogs receiving certain commercially prepared baked dog foods. Some toxic factor present in wheat gluten is thought to be the cause of the symptoms noted. It was noted, too, that dogs tend

to become resistant with age to the toxic effects of wheat gluten.*

Morgan and Groody[12] in 1944 also reported on the occurrence of running fits in dogs fed a commercially prepared dog food containing 20 per cent of protein. The fits developed as early as the fifth day when this food was used as the sole diet. Thiamine, choline, and pyridoxine were ineffective in preventing the occurrence of the fits. But when 20 Gm. of raw casein was fed with the diet, the fits did not occur. The addition of fresh, ground raw beef lungs, meat scraps, and fish to this diet also prevented the occurrence of fits. In 1946 Morgan and Groody[13] reported further tests on a fit-producing diet. They stated that a diet similar to two which produced fits in dogs when tested previously and which contained 63.2 per cent of wheat flour, when supplemented with 4.3 per cent of ground, fresh beef lungs, 4.6 per cent of meat scraps, and 4.7 per cent of fresh ground fish, no longer produced fits. It was thought that using fresh meat and fish as the source of protein prevented the occurrence of fits, because the otherwise fit-producing foods contained, respectively, 15.7 and 18.9 per cent of meat meal and 6.9 per cent of soybean meal as their chief source of protein.

It has been stated, too, that potatoes and bread will produce fits in dogs when fed in large quantities. But Berryman[14] and I were unable to produce fits in young dogs by giving them potatoes and skimmilk, or bread and skimmilk, as their sole diets. We also were unable to produce fits in dogs by feeding them diets which were deficient in protein and thiamine.[15, 16]

It has been observed, too, that certain sounds tend to incite abnormal nervous reactions. Auer and Smith[17] observed that the hissing sound made by the escape of air through a jet opening will produce fits in some white rats. Certain high frequency sounds will cause some dogs to howl and loud noises such as the report of a gun or thunder may so frighten a dog that it becomes hysterical.

An hereditary cause of fits has often been suggested, but such has not been demonstrated experimentally. However, since hereditary epilepsy occurs in human beings, and human beings biologically are animals, it is possible that such ailments also occur in dogs.

Brain and spinal cord tumors which are a frequent cause of nervous disease in man are of infrequent occurrence in the dog. However, prolapse or protrusion of intervertebral discs is frequent and is a common cause of posterior paralysis in the Dachshund and Cocker Spaniel.

Arteriosclerosis and other vascular diseases, which are a frequent cause of lesions in the nervous system of man, are infrequent in lower animals. They are of only minor importance as regards the development of nervous diseases in animals.

The histopathology of nervous ailments is various and in some instances is obscure. At necropsy in 134 consecutive cases in which the dogs had died or had been destroyed because of various nervous diseases, the following lesions were revealed: Focal and disseminated lesions of encephalitis were present in 94 instances. In approximately 60 per cent of the cases, the lesions were characterized by infiltration of leucocytes into the intercellular and perivascular spaces, and in 40 per cent they were characterized by degeneration of the cells or tissues only, which varied from disappearance of Nissl bodies to complete destruction of the nervous tissues. In 2 instances large areas of liquefaction necrosis were present. The conditions observed in the remaining 40 dogs in this series were in the order of their predominance: myelitis, 14; protruded intervertebral discs, 10; hydrocephalus, 9; primary brain tumor, 2; metastatic intracranial tumors, 2; brain abscess, 1; cerebral cyst, 1; and spinal cord tumor, 1. The lesions observed in this series of dogs may in some instances bear little relationship to the occurrence of the symptoms, because large lesions which produce no symptoms may be made experimentally in the cerebrum. The cause of the symptoms may be the same as the cause of the lesion.

*Elvehjem and his associates (J. Am. M. A., *135*, (Nov. 22, 1947): 760-763) has recently demonstrated that the compound nitrogen trichloride used in bleaching wheat flour is the causative agent of the fits observed.

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Preserving Blood Samples

An old method of taking and preserving blood samples for cell counts and physiologic work has recently come into more general use. Heparin is the anticoagulant used. The blood is mixed with it when drawn. It facilitates the work, and there is no danger of using too much as in the case of citrates, nor is shaking necessary as it is when oxalated cloth is used. The cells are not broken up to spoil the determinations.

A clean, glass 5-cc. syringe may be filled with heparin and promptly emptied back into the bottle. Enough heparin will remain on the walls of the barrel to preserve 3 cc. of blood. When this amount is drawn from the vein and the needle withdrawn, the blood is drawn back the full length of the barrel so that it comes in contact with all of the adherent heparin. The sample is then emptied into a bottle and refrigerated until needed.

If a larger amount of blood is desired, a 10-cc. syringe may be used with a 16- or 18-gauge needle 1¼ to 1½ in. long. Heparin is drawn through the needle from the bottle until it shows in the syringe. Holding the syringe vertically, with the needle and bottle up, the plunger is gently pushed all the way down. This leaves the needle full of heparin. It is then withdrawn from the bottle, and the blood sample is taken with the same syringe and needle. This amount of heparin will preserve 10 cc. of blood effectively.

If the syringes are scrupulously washed and dried between taking of samples, the heparin does not become contaminated and may be used over and over if the first method is desired.—*J. W. Bailey, D.V.M., Ft. Atkinson, Wis.*

Noncerebral "Polio" and Louping Ill

Experiments with the virus of louping ill of sheep in June and July and again during the winter showed a remarkable difference in the infectivity of the inoculated virus during the two seasons. Whereas 55 per cent of the sheep inoculated in wintertime developed cerebral symptoms (encephalitis), none of those injected in the summertime developed any evidence of nerve-center involvement. The conclusion drawn was that environmental, nutritional, and climatic influences favor the spread of the virus into the brain. The experiment on louping ill (*Brit. M. J.*, Oct. 11, 1947: 386) indicated that the presence of the virus is common, but paralysis occurs only in a small proportion of naturally infected sheep, and it added force to the belief that the inapparent infection principle is applicable to infantile paralysis — the virus is common but strikes the nerve centers only when the blood-brain barrier breaks down.

Medication for Brucellosis.—So far, we have no specific treatment to offer which will overcome undulant fever infection with certainty. Brucellin, a vaccine, has occasionally been helpful. Penicillin has had no effect. Sulfonamides have been used with mild success. Streptomycin has thus far been disappointing. Streptomycin and sulfadiazine combined has arrested the infection promptly enough to warrant further trial.—*Illinois Health Messenger.*

Lymphomatosis is probably transmitted both from hen to chick through the egg and from chicken to chicken by contact.

Paratuberculosis

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PARATUBERCULOSIS, also called Johne's disease, is a chronic infectious disease manifested by periodic diarrhea and progressive emaciation, by thickening and the formation of folds in the intestinal mucosa, and is caused by an acidfast and alcohol-fast bacillus, resembling the tubercle bacillus. This bacillus is called *Mycobacterium paratuberculosis* or *Mycobacterium johnei*. In 1895 the disease was first studied by Johne (after whom it was named) and Frothingham. The disease occurs in many countries and is especially prevalent in intensively cultivated agricultural districts, where it causes considerable annual losses in some herds. It is therefore not surprising that it occurs quite often in The Netherlands with its many herds of cattle, and the Dutch veterinarians are naturally greatly interested in this illness. I shall try to report on the data we have collected in the Netherlands.

Fig. 1—A map of the province of Friesland, showing the cases of paratuberculosis occurring between 1931 and 1942. Each dot represents an animal in whose feces the paratubercle bacilli could be demonstrated. The solid dark parts represent lakes.

During the seven years in which I practised as a veterinarian, I saw much of this disease. Later, at our Institute of Infectious Diseases, Houthuis prepared a thesis on paratuberculosis under my supervision. During the past few years, Mr. Sjollema, director of the cattle station for the province of Friesland, has done much work on this subject.

It had already been observed in France that the nature of the soil could influence the prevalence of Johne's disease. In strongly infected regions, a low percentage of calcium and low pH were found. In regions with a less degree of infection, both the Ca percentage and the pH were higher, while in regions where Johne's disease didn't occur at all, the Ca percentage and the pH of the soil were still higher. In Friesland, too, we got the impression that the nature of the soil often is of great importance. Figure 1 is a map of the province of Friesland, lying by the sea. The solid, dark parts are lakes; the other dotted areas show the cases of paratuberculosis between 1931 and 1942. Each dot represents an animal with feces in which the paratubercle bacilli could be demonstrated. Now the northwest part of the coast has many cattle. The soil is mostly sea-clay, and it was observed that the number of cases there was strikingly smaller than in the boggy part of the province. The results of a trial experiment to ascertain the pH is shown in chart 1. In the left-hand column the pH increases from the bottom upwards. The next column shows the number of cases per 2,000 head of cattle. The letters underneath the chart indicate the names of the municipalities examined. The dotted pH line and the continuous paratuberculosis line do not run parallel, but intersect. This is very clear in the right half of the chart. As the pH decreases, the number of paratuberculosis cases increases. At the extreme right, with the lowest pH,

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I am greatly indebted to my colleague, P. Sjollema, for his kindness in putting his notes, maps, and charts at my disposal.

the number of cases is the highest. From these observations it is obvious that soil examination is of great importance in controlling infectious diseases. We need a geography of infectious diseases of the whole world. If it were compulsory, every-

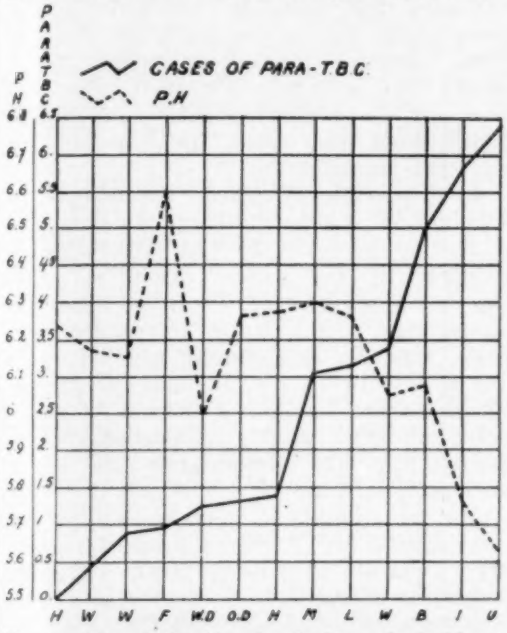


Chart 1—The relationship of soil pH to the incidence of paratuberculosis reported in Friesland. Letters underneath the chart indicate names of municipalities examined.

where, to report each case of paratuberculosis, and to examine the nature of the soil, this would, without doubt, lead to important results. Probably we would then be able to control the disease by changing the soil in regard to Ca percentage, pH, and perhaps some other factors. In my opinion this is infinitely important.

It is well known that a paratubercular cow with diarrhea infects the pastures. Infected pools and puddles are also notorious. Infection takes place by way of infected food and drink. We may now accept as proved the fact that infection takes place during the first months of life. After two years the animals are practically insusceptible. From this we must draw the inevitable conclusion that, in order to control the disease effectively, the younger animals must be kept isolated, both in the pasture and in the stables. Benefit has already been derived from practical application of this measure.

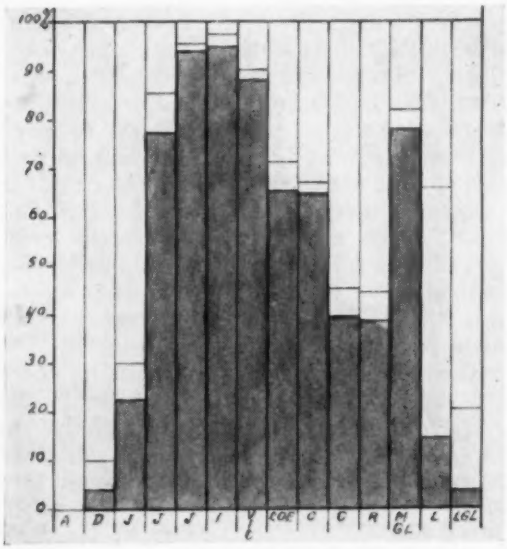
In diagnosing the disease, the anamnesis is of great importance. After the animal has been infected during the first months of life, the disease remains temporarily latent. Clinical symptoms first occur during the third or fourth year. The first symptom is a poorer general condition. A pallor of the mucous membrane is noticeable; the skin is less supple. These symptoms usually follow soon after parturition. Later on, diarrhea occurs (sometimes alternated with normal feces). Other symptoms are emaciation and swelling that develops in the submaxillary region. Many observations show that an animal with Johne's disease may recover spontaneously. A sure diagnosis is only possible after examination of the feces. Only when the typical clumps of bacilli are found is a diagnosis of paratuberculosis justified. Unfortunately, the result of this examination is often negative even when the disease later proves to have been present. Various techniques are followed in examining the feces: Mr. Sjollema prefers to treat the feces with antiformin for eighteen hours, then centrifuging and coloring the smear made from the sediment, according to the Ziehl-Neelsen method. But with this technique it is also true that a negative result does not preclude paratuberculosis.

The johnin test is also important. There are some differences of opinion as to the correct procedure in preparing johnin. In Friesland the best results were obtained by preparing the johnin from a mixture of five strains. There is also a lack of uniformity in the application of the test. In Friesland the intradermal test was the most satisactory. The most suitable part of the skin proved to be the anterior half of the neck side. If tuberculosis is precluded, a positive reaction points with

I	43	24 +(56%)	7 ?	12–
II	86	53 +(62%)	11 ?	22–
III	18	14 +(78%)	3 ?	1–
IV	2	2 +(100%)		

Chart 2—Reactions to the johnin test in 149 cases of paratuberculosis. The cattle are grouped according to their general condition.

great probability to Johne's disease. The reverse is not true; about one third of all animals with paratuberculosis have negative reactions. Often these negative reactions are found in animals that are seriously ill. One hundred and forty-nine paratubercular cows were given the johnin test. These cows had been divided into four groups, according to their general condition. The results are shown on chart 2. The groups with a poorer general condition have a higher percentage of misleading negative reactions. Of course, as the technique of culturing johnin is perfected, the test will become more dependable, but a great number of negative reactions in infected animals will always occur. The space is too



Graph 1—The results of histologic examination of 151 paratubercular cows. The dark part of the columns represent the cases in which bacilli were found; the light part indicates cases in which no bacilli were found, but histologic changes were observed.

limited to allow discussion of the immunologic grounds for these reactions. I think it would therefore be a good thing if other methods of diagnosis, such as the complement-fixation test, were given a practical trial.

Postmortem diagnosis is much easier, especially after a histologic examination. As you know, the intestinal tract especially is affected but, as we could affirm in our institute, histologic changes in the liver are also repeatedly observed. Mr. Sjollema examined 151 paratubercular cows. Sections were made of the digestive stomach, ten different parts of the intestines, the intestinal lymph glands, the liver, and the lymph gland of the liver. The results are shown in graph 1. The dark part at the bottom of each column represents the cases in which bacilli were found. The light part indicates the cases in which no bacilli were found but where histologic changes were observed. The ileum proves to be most often affected. We must also note that serious paratuberculosis and serious tuberculosis may occur simultaneously in the same animal.

Is it possible to control the disease by vaccination? Vallée and Rinjard recommend a vaccine prepared by the trituration of cultures of the causal organisms with pumice-stone, vaseline, and olive oil. After subcutaneous inoculation in healthy animals, a hard node develops, which persists for a year or longer. In infected animals on the other hand, the inoculated bacilli were said to be quickly reabsorbed. Our experience in The Netherlands has led us to conclude that this method is of no value for diagnostic purposes or for immunization. Mr. Sjollema found that 9 of 34 vaccinated animals certainly had paratuberculosis, while in 2 others the disease was extremely probable. According to Mr. Sjollema, another disadvantage is that this vaccine causes a positive tuberculin reaction. This would greatly confuse the control of tuberculosis.

As a result of the points I have discussed, we would recommend the following plan:

1) Improvement of the soil in regions where Johne's disease occurs (for instance, with a Ca fertilizer).

2) Raising cattle free of Johne's disease by pasturing and stabling the young animals apart during the first two years.

3) Searching for infected animals by a thorough clinical examination, including examination of feces, the johnin test, or other tests. Affected animals should be slaughtered.

I am sure that, if all these points are conscientiously observed, this sneaking, lingering disease that causes such great economic losses will be entirely eradicated.

Intravenous Medication. — Medicines given intravenously should be well diluted, warmed to body temperature, and administered slowly. Injection of cold solutions may produce fatal shock.—*Dr. W. J. Gibbons in Auburn Vet., Winter, 1947.*

Multiple Pulmonary Abscesses in a Cow

On July 7, 1947, a 6-year-old Holstein-Friesian cow had been steadily losing condition since a week after freshening in March. There had been no parturient trouble. The cow was purchased in the fall of 1946, and no history was available prior to that time. The herd was negative to brucellosis, and a tuberculin test in February, 1947, had shown no reactors.

The cow was little more than skin and bones, though her appetite was good. She was weak but able to walk about. The respiration and temperature were normal, but the pulse was exceptionally strong. A cough was easily induced, but a deep, moist cough was frequent without any stimulation. Bowel movements were normal in amount and consistency.

Auscultation revealed extensive areas of hepatization in both lungs. Râles were absent. There was no nasal discharge nor mouth breathing. The breath had a normal odor.

The owner was told that the cow had pneumonia, probably secondary, and was advised to sell her for beef as the prognosis was unfavorable and there was nothing we could do. He preferred to keep her, however, in order to find out what the primary trouble was, so we agreed to do our best.

A blood count showed 5,000,000 red blood cells and 7,300 white blood cells, causing us to dismiss traumatic gastritis or liver abscesses as possible factors. A fecal examination showed neither lungworm larvae nor ova of other worms. The urine was negative to the Ross test for acetonemia. Two other animals in the herd were noticed to have a severe diarrhea, and the owner said that they had been scouring since the middle of the previous winter and that the sick animal also had scoured intermittently. These facts suggested the possibility of Johne's disease. The negative tuberculin test in February indicated freedom from tuberculosis, but there was still a possibility that the disease was too advanced to react.

A week after the first call, the animal died. Postmortem examination revealed multiple abscesses of the lungs. The largest one contained about a gallon of creamy, foul-smelling pus. As the other organs and the joints were normal, there had been no metastasis. There were no scars nor adhesions to indicate that traumatic injury had caused the abscesses. The mucosa of the intestines, ileocecal valve, and rectum were normal, thus discounting the probability of Johne's disease. On section of the lung and culturing, *Corynebacterium pyogenes* was identified.

It was postulated that the cow had suffered an attack of pneumonia or hemorrhagic septicemia before the owner had purchased her, and the lung damage was not apparent until parturition. Subsequent lowered resistance caused a fatal renewal of infection.—*J. W. Bailey, D.V.M., Ft. Atkinson, Wis.*

Effect of Penicillin on Blood of Normal Horses

Lt. Col. V. A. Karev and Capt. I. D. Zherebtsov (*Veterinariya, 24,* July, 1947: 22-24) prepared crude penicillin from *Penicillium crustaceum,* a native species. It was not purified because amyl acetate was not available. The titer reported was approximately equivalent to 26 Oxford units per cubic centimeter. It was administered intramuscularly and intravenously to 5 horses in daily doses of 5,000 to 13,000 units for eight days. No toxic symptoms appeared. The principal alterations in the blood were: reduction of alkali reserve, reduction of percentage of segmented neutrophils, increase in percentage of unsegmented neutrophils and lymphocytes, and an increase in catalase and protease. Two weeks were required after the last injections for the values to return to pretreatment levels.—*R. E. Habel.*

Inapparent Virus Diseases of Animals.—The number of animal species affected with various virus infections is increasing (*Lancet,* May 31, 1947), and much has been learned [from them] on the links between man and animal infections. The subject under discussion was encephalitis in cats as a source (reservoir) of neurotropic viruses affecting the human being. A case of lethargic encephalitis in a middle-aged woman was obviously traceable to her cat which had shown nervous symptoms for many months and whose brain tissue proved to be infective for other cats.

Louisiana health officials reported the deaths of 2 children from encephalitis supposedly contracted from horses.

The Unknown Etiology of Paratuberculous Enteritis (Johne's Disease)

Much remains unknown about the etiology of Johne's disease. *Mycobacterium paratuberculosis* alone is not the cause, and the contributing factor is not known. Experimental infection, difficult to achieve, is possible only by drenching. When and how the organism implants itself in the enteric structure and lymphatic nodes has not been shown, nor has the nature of the breakdown in health that favors the genesis of the malady ever been explained. If the partly proved congenital theory is valid, the organism possesses the remarkable property of lying dormant for an average of five years before announcing its presence by clinical evidence. Hagan (U.S.A. 1935) exposed 20 calves 6 months old to severe infection. Of these, 4 died at the age of 8, 15, 19, and 24 months; of the remaining 16 slaughtered at the age of 3 years, 11 of them had gut lesions from which the organism was recovered, and 5 resisted entirely. The importance of this (Hagan's) research is the long period (3 years) during which the infected animals remained in good health after inoculation. What factors tip the balance between host and parasite? Postmortem lesions are often found in animals that have shown no clinical evidence of the malady, and reactors to johnin live on, apparently healthy, for years. In certain districts having sandy soils, Johne's disease, though rare, is frequently found in autopsies performed to detect other conditions. That the infection takes place in the young can neither be confirmed nor refuted in field observations. In practice, it is better to regard adults as being susceptible and to avoid exposure. The author regards heredity "an unmeasured factor."

Even in its modern form, johnin produces too many anomalous results to be employed with confidence in the diagnosis of the infection. The microscopic examination of a direct smear of feces is more fruitful than is generally known and is within the practitioner's reach. The possibility of confusion with other acidfast organisms is not great.

Improvement is effected where farmers watch closely for the first signs of the disease and dispose of the animal before the infection reaches its peak. It all sums up to making conditions more favorable for the host and a bit less favorable for the parasite.—*H. T. Mathiews, M.R.C.V.S., B.C.Sc., D.V.M.: "On Johne's Disease," Vet. Rec., 59, Aug. 16, 1947: 397-399.*

The Sweat Glands of the Dog

Although dogs sweat visibly from glands located on the palmar face of the paws only, there are nonsweating, lumenless glands spread all over the dog's skin. Unlike the sudoriferous glands of sweating animals, their ducts open into the hair follicles and obviously affect the sheen of the coat through the intermediary of the apocrine character of their secretion. The dog's increasing importance in clinical and experimental medicine and the known relation of its sweat glands to certain cutaneous tumors may bring these forgotten glands into prominence. Having no lumen, the sudoriferous glands of the dog are in effect lobulated clumps of epithelial cells in countless millions seemingly associated with the integrity of the hair.

Dangers of the Rodenticide, "1080"

Sodium monofluoroacetate, or compound 1080, is an effective rodenticide, but highly poisonous to dogs, farm animals, and man. Its presence in food or water might be unrecognized because it is virtually odorless and tasteless—hence the need for special precautions wherever it is used. Moreover, its absorption from the digestive tract appears to be sufficiently rapid to allow for the absorption of lethal amounts before its toxic effects are felt.—*Bull. U. S. Army Med. Dept.*

Rheumatism.—There is no established evidence that animals suffer from rheumatism, nor is there any agreement among pathologists, including rheumatologists, as to the nature of the numerous maladies called rheumatism. The nearest thing in veterinary medicine to rheumatism is the disease set apart from the others as osteoarthritis, better known to us as spavin and ringbone. If rheumatoid arthritis, rheumatic fever, gout, and fibrositis exist among the ailing animals filing through the animal clinic, they certainly have not been well enough described to identify.

Rancid dietary fats tend to destroy vitamin A.

Lumpy Skin Disease (Knopvelsiekte) of Cattle in Southern Africa

GILLES De KOCK, D.V.M.
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LUMPY SKIN DISEASE is an acute, febrile, infectious disease of cattle of southern Africa. Apparently this disease was investigated in northern Rhodesia about 1930, where it was known as pseudo-urticaria, and at that time not regarded as an infectious

Infected animal, showing lumps on the neck.

disease. In 1943, it appeared farther south, in Ngamiland, Bechuanaland, and towards the close of 1944 it was diagnosed in some of the northern border districts of the Union of South Africa. By 1946, it had spread over the greater part of the Union, in spite of the control and quarantine measures applied in an attempt to arrest its progress. It became a disease of great economic importance and a threat to the cattle industry of South Africa. How this long-distance spread from northern Rhodesia in 1930 to the Union borders in 1944 was effected remains a complete mystery.

The characteristic "lumps" (*see* photographs) by which the disease became recognized and known are not confined to the skin, but may also be found in the mucous membranes of the mouth, nostrils, pharynx, larynx, trachea, and gastrointestinal tract, and such lesions have also been identified in the lungs, musculature, udder, and genital organs. These lumps in the skin may vary from a few without any further symptoms to cases where the whole skin becomes involved. Sometimes the lumps may become confluent. There may be edema of the brisket, one or more limbs, and udder, and often the lymph nodes are markedly swollen.

The lumps vary in size from ½ to 1 inch in diameter and are situated in the dermis. Over them the short hairs may stand erect. There is moderate fever with loss of appetite, a stiff awkward gait, and disinclination to move. Loss of condition is marked and rapid. The nodules in the other organs are more or less of the same size and appear as flat, rounded, greyish yellow areas, which later may give rise to ulceration on the mucous membranes. Difficult breathing may develop when the respiratory tract becomes involved, and the animal may die of asphyxia. The milk flow usually drops sharply in the lactating cow and lumps frequently develop on the teats.

In some herds, a few animals may be

Section of scrotum showing nodules in various stages.

A brief review of this new disease of cattle. Dr. de Kock is deputy director of Veterinary Services of South Africa, Onderstepoort.

lightly affected whereas in others the morbidity may be extremely high. The mortality does not exceed 10 per cent, but there is a serious economic loss as a result of the marked emaciation, damage to the skin, loss of milk, injury to the reproductive organs, and slow recovery. Pneumonia, cachexia, and cracking and sloughing of the skin are some of the important sequels.

The nodule in the dermis of the skin is of the nature of a nonpurulent inflammatory reaction, in which there is an infiltration of mononuclear cells and fibroblasts, sometimes with fibrin, followed by necrobiosis. There is a hypertrophy of the rete cones, and in the cytoplasm of the epithelial cells "inclusion-like" bodies have been demonstrated. They are more or less spherical and about the size of the nucleus of the cell. They stain a reddish pink with phloxine stain. The nodule in the skin may heal out and lead to scar tissue, and this may indicate evidence of previous infection for many months. Molluscum contagiosum of the human being is the only disease to which it has some slight resemblance.

The disease is believed to be caused by a virus and probably transmitted by some biting insect. It does not spread by contact and can only be reproduced in cattle experimentally by the injection of blood or emulsified lumps from an infected animal. A team of research workers is studying various aspects of this baffling disease. So far, it has not been transmitted to the various laboratory animals, including ferrets. Attempts are being made to infect fertile eggs.

Unfortunately, only a certain number of cattle injected develop symptoms and, by passage in cattle, infection usually disappears by the third generation. Fresh virus from natural cases must be collected from time to time. This greatly hampers and complicates the investigations, especially in respect to studies on susceptibility, infectivity, and immunity.

Histamine.—To the biochemist, this freelance product of catabolism is $C_3H_3N_2(CH_2)_2NH_2$, otherwise designated as the amine, beta-imidazolylethyl. To what extent the human and plant and animal doctors have to fuss with histamine, in primary or secondary rôles, is a question of considerable moment.

Piroplasmosis in a Newborn Foal

Infection with *Babesia caballi* was suspected in a newborn foal. Laboratory examination of a blood smear taken from the foal twelve hours after birth confirmed the presence of piroplasmosis, but the mare's blood was negative. Inasmuch as the minimum incubation period is one week, the foal must have become infected before birth. It died within twenty-four hours. A complete history of the mare was not available, but it seemed likely that she had once been infected and was now a carrier. The case was reported from Africa (*Vet. Rec., 59,* Sept. 13, 1947: 449).

Atypical Acetonemia

The subject was a 5-year-old Guernsey cow affected with mastitis that the owner said differed from any mastitis he had ever seen in his herd.

The milk was thick and yellow from all four quarters, but there was no evidence of pain or swelling in the udder. Production was greatly decreased, and the cow was off feed. Pulse, respiration, and temperature were normal, but the cow was somewhat depressed.

The urine sample taken reacted strongly to the Ross test almost immediately. A pint of 40 per cent glucose was given intravenously, and the owner was advised to feed her a pint of corn syrup twice daily for a few days.

A return call the next morning showed the cow giving normal milk, eating better, and increasing in production. A week later, she had regained her former production of 40 lb. of milk daily, and there had been no further recurrence of the trouble.—*J. W. Bailey, D.V.M., Ft. Atkinson, Wis.*

"Most Toxic Known Substance."—A highly toxic, needle-shaped, crystalline protein that may be the pure toxin which causes the severe botulinus food poisonings has been isolated from a type A culture of *Clostridium botulinum.* A great deal of work with this product was done at Camp Detrick, Md., where techniques of separation, purification, and crystallization were developed by Lamanna and others. It is described as "probably the most toxic known substance per unit of weight."—*Biol. Abstr., June-July, 1947.*

NUTRITION

Nutrition Notes

Good calf hay should contain at least one-third to one-half legumes.

Six Canadian provinces and 31 states have reported boron deficiencies which affected growth of more than 40 crops.

Pregnant sows need iodine and vitamin A. Iodine deficiency often results in hairless pigs, and vitamin A deficiency in no pigs at all.

The vitamin A in a calf ration appears to make protein more available; at least it improves digestion and absorption of protein.

Losses of 20 to 50 per cent of lambs in certain districts of central and northern Wisconsin have been overcome by adding supplementary cobalt to the ration, and the use of iodized salt. Cobalt and/or iodine deficiency is expressed by loss of appetite, anemia, and unthriftiness beginning at 3 months of age.

Organisms in cheese responsible for disease outbreaks include *Eberthella typhosa*, the Salmonella group, *Clostridium botulinum*, and streptococci.—*J. Milk & Food Technol.*

Phosphorus deficient soils grow better calves, according to reports from the King Ranch in Texas, if disodium phosphate or completely defluorinated triple superphosphate is added to the drinking water at the rate of 6.5 Gm. in each 6 gal. of drinking water. The phosphorus is readily and completely assimilated.

Biochemics of Intelligence.—Recent research demonstrating that glutamic acid, which is present in body protein and food, facilitates intellectual functions, suggests a biochemical means of improving brain function. According to *Nutrition Reviews* (June, 1947), the recorded studies on glutamic acid open an entirely new avenue of approach to the problem of mental defects, considered unalterable up to now.

Excessive feeding of cobalt may cause poor coat and muscular incoördination.

The ration of the brood sow should contain 10 to 15 per cent of alfalfa hay or alfalfa meal of good quality.

The pellagragenic action of corn has been attributed both to its lack of tryptophane and to the presence of a positive toxic agent in the cereal grain that destroys niacin or inhibits its action.

Orphan pigs may be raised on the following formula, says Dr. J. C. Carey, West Liberty, Iowa: cow's milk 1 lb.; lime water, 1 lb.; cream, 4 oz.; sugar 4 tablespoonfuls (or Karo syrup 6 tablespoonfuls). Feed pigs what they will clean up promptly four or five times a day.

Dermatosis in Calves

Dermatosis in calves is characterized by the development of a severe dandruff followed by loss of hair in blotches and cracking of the thickened skin. The dandruff and loss of hair occurs first around the poll and ears, spreading over the neck and the back to the base of the tail. Some animals become debilitated and die.

Cole, Rasmussen, and Thorp (*Vet. Med.*, May, 1944) reported the occurrence of this dermatosis in calves and found the blood plasma ascorbic acid to be extremely low.

My treatment consisted of subcutaneous administration of 3 Gm. of ascorbic acid. In the more severe cases, it was necessary to repeat the doses. I have had good results with this treatment except in cases markedly debilitated and moribund. The oral administration was not effective. Since adequate intake of vitamin A is said to cause a rise of ascorbic acid in the blood, it ought to be effective in preventing the disease in an affected group of calves.—*R. O. Rydell, D.V.M., Wheaton, Minn.*

Vitamin A Deficiency in Young Bulls

Twenty young bulls, ranging in age from about 1½ to 3½ months when started on experiment, were given varying deficiency levels of vitamin A. Three bulls on a ration containing 2,000 I.U. of the vitamin daily became totally blind in less than six months. Others receiving 4,000 to 6,000 units developed night blindness or total blindness. Convulsions were common.

From a reproductive standpoint, sexual maturity was delayed, sex drive inhibited, and spermatogenesis limited. Cystic pituitary glands were a typical feature, and there was histologic evidence of damage in both the anterior pituitary and the adrenal glands.

The study was undertaken by Erb and coworkers at the Purdue University experiment station for the express purpose of finding out if prepuberal vitamin A deficiency can cause permanent impairment of the reproductive processes. The aggregate results (*J. Dairy Sci., 30,* Sept., 1947: 687-701) suggested that prepuberal damage produced by lack of vitamin A may be permanent—hence, not amenable to vitamin therapy later in life—especially when cystic pituitaries develop or total blindness occurs. The results further showed that even a moderate deficiency will severely impair reproduction.

Vitamin D_2 in Dogs.—Beck, Collins, and Freytag of the University of California produced malformation and deformations in the roots of young dogs' teeth by giving large doses of vitamin D_2 and vitamin D_3 daily for five months. The lesions consisted of pathologic calcification of the pulp (stone formation), paradontium hypercementosis, and paradentosis. There was no evidence of repair after recovery.—*Biol. Abstr., Sec. E, (Apr., 1947): 815.*

More Nutritious Milk from Vitamin E Fed Cows

By supplementing winter fodder with a gram a day of concentrated vitamin E per cow, milk can be made more nutritious and more digestible, Hickman and coworkers told the American Chemical Society (New York, Sept. 18, 1947). In their tests, milk from vitamin E-fed cows was richer in vitamins A and E and up to 30 per cent richer in butterfat. When soured, such milk formed a soft, custard-like curd that remained dispersed in the whey, instead of the usual chunky curd which separated from the whey. Improvement in the general health of the experimental herd also was reported.—*Certified Milk, Oct., 1947.*

To assume that the B vitamins are not as important in fat metabolism as in carbohydrate metabolism may be merely a reflection of our ignorance of the biochemic transformations involved in the ultimate breakdown of fat.—*Elvehjem and Krehl, J.Am.M.A., Oct. 4, 1947.*

Nutrition Notes*

Work at Cornell University showed that fats added to dairy feed after extraction from oil-bearing seeds have much less value than equivalent quantities of fat existent in the natural feeding stuff.

Supplements containing a large percentage of fermentation by-products have produced high quality beef.

Linseed meal has found favor in feeds for cattle, sheep, and horses because of its mucin content. Poultry have difficulty with linseed meal in feed because the mucin exerts a detrimental laxative effect on the short alimentary tract.

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For rapid growth of turkey poults rations containing 26 per cent or more protein are recommended. Soybean protein does a good job in such rations, whereas the sole use of other vegetable proteins slows up growth.

Breeder rations for poultry must contain some fish meal along with soybean meal to avoid perosis in day-old chicks. Pasting-up in poultry during the first week of life has been blamed on too high a soybean meal content of rations. This may occur with certain solvent-extracted meals and can be corrected by feeding cracked corn.

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Hog nutrition today is at the same stage of development as poultry nutrition was twenty-five years ago.

Soybean meal properly supplemented with minerals and vitamins can adequately replace tankage for drylot feeding of hogs.

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*Extracts from a paper entitled "New Horizons in Animal Nutrition and Farm Chemurgy" by H. J. Prebluda (*Feedstuffs,* Apr. 12, 1947).

Folic Acid in Swine Nutrition

An experiment made by Cunha and several others at the State College of Washington (*J. Nutri.*, 34, Aug. 11, 1947: 173-186) points to a possible growth-promoting value for folic acid when fed to swine on natural grain rations plus tankage. During an extensive study of swine nutrition, these workers observed that pigs fed a folic acid supplement made faster gains and required less feed per pound of gain the first four weeks they received the vitamin. In a five-week period immediately following, however, folic acid did not improve the rate of gain, although it helped to give the pigs a cleaner appearance and bigger appetites.

Meat Spots and Blood Spots in Eggs

Studies of the incidence of meat spots and blood spots in the eggs of 85 Rhode Island Reds made by Denton of the BAI at the Beltsville station (*Poult. Sci., 26*, May, 1947: 272-276) revealed meat spots in 72 per cent and blood spots on 3 per cent of the eggs examined. The eggs were laid during the three periods, September-October, March-April, and June-July. Season had no effect on the occurrence of these defects nor was there any difference in the eggs of hens fed supplementary vitamin K, or those given access to green grass range or fed grass mixtures. Errors in candling to detect the faults ran about 28 per cent.

Vitamin E in Cardiac Disease of Small Animals

Although skepticism rather than endorsement is the prevailing attitude on reported virtues of vitamin E in heart disease, increasing experimental and clinical work along this line is producing results that cannot be overlooked.

Now added to the evidence on behalf of vitamin E in cardiac disease is a report by N. H. Lambert of Ireland (*Vet. Rec., 59*, July 19, 1947: 355-356), concerning apparent therapeutic benefits from oral administration of this vitamin to aged dogs and cats. The report cites "considerable improvement in cardiac and general condition" of about 50 dogs and cats so treated and describes 7 of the cases in detail. Data on the 7 cases emphasize rejuvenating qualities of the treatment, as well as spectacular recovery from debilitating heart conditions. Usual dosage was a 3-mg. tablet given three times a day for two or three weeks, and less often for one to three or more months afterward.

Cobalt Tolerance. — Recent studies (*J. Dairy Sci.*, Aug., 1947) show that growing dairy cattle may consume about 50 mg. of cobalt per 100 lb. of body weight daily, without ill effects. This is over 100 times the amount normally consumed from commercial, cobalt-fortified dairy rations.

Celery Trimmings as Chicken Feed.—Dehydrated celery tops and trimmings were found to compare favorably with alfalfa meal as a feed for chickens in tests made at the Florida experiment station. Each year about 75,000 tons of celery trimmings from Florida packing houses have been channeled to farms for use as fertilizer, but now commercial dehydrating plants in the state are processing the trimmings into feed.

Agene-Treated Flour. — Flour manufacturers and the Food and Drug Administration have been conducting tests with agene-treated flour ever since Sir Edward Mellanby's announcement (Dec., 1946) in England that this type of flour induces canine hysteria when fed to dogs. Aggregate results of these tests: Such processed flour apparently has no ill effects on human beings or on animals other than dogs.—*Paul B. Dunbar, Food & Drug Commissioner.*

Milk Flavor Not Distorted by Soybeans.—Iowa State College investigators apparently have exploded the theory that soybean feeding causes off flavors in milk—a theory based on the assumption that soybeans increase the proportion of unsaturated fatty acids in butterfat and thereby influence the development of oxidized flavor. Neither cracked soybeans nor soybean hay seemed to pervert milk flavor and, in fact, the milk scores were slightly higher with a good quality of soybean hay than with alfalfa hay of lower quality.—*Bartley and Cannon (Iowa).*

Vitamin A deficiency retards the synthesis of vitamin C in cattle.

EDITORIAL

Presenting—"Valiant Years"

"Valiant Years" is the title of a new motion picture which tells the story of man's fight to improve his standard of living by eliminating animal plagues. It traces the rise of veterinary medicine from a rural art to a learned profession. This is done by presenting a panorama which incorporates many of the major contributions made by veterinarians to preserve and augment man's supply of food, clothing, and shelter insofar as these are derived from animals or from animal products.

The picture is a portrayal of fifty years of general veterinary practice, as exemplified by the typical, though fictitious, Dr. Wesley Kane. The lead is played by Mr. Norman MacKay, and his enactment of the several scenes around which the picture is built is so sincere and true to life that many an animal owner will see his own veterinarian doing just the same things under exactly the same conditions. The picture delivers no lecture; it simply tells a story with sufficient human interest to attract and hold the attention of almost any audience.

The story revolves around Wesley Kane, who, as a boy of ten, lost a shote which he was fitting for exhibition at the county fair when hog cholera appeared on his father's farm. This loss convinced him that he should study veterinary medicine in order that other boys might avoid similar experiences in the years to follow. Other high points are the finding of a tuberculin reaction in a cow purchased by a boyhood friend, and the finding of tick fever ticks on a cow in his community after it had been shown that ticks spread the disease.

These are not the only veterinary problems mentioned. Not by any means. Also woven into the script and the pictures are the importance of the soil in raising livestock and of the livestock in maintaining soil fertility, the relative safety of raising livestock in the United States as contrasted with other countries, the value of foods of animal origin in formulating a human diet which has made America the world's healthiest nation, and the place which animal products has attained in contributing to making and maintaining the U.S.A. as the best clothed nation.

The veterinarian, Dr. Kane, is kept in the very forefront of all these activities. He is shown either engaged in or discussing such a wide variety of topics as sleeping sickness in horses, brucellosis in cattle and pigs, pullorum disease in poultry, delivering the newborn, vaccinating to prevent lockjaw and other diseases, eradicating foot-and-mouth disease, controlling swine dysentery, caring for dogs as household pets or as companions in field sports, inspecting meat at a packing plant, and calling attention to the fact that many diseases of animals may be transmitted to man.

All this is accomplished without confusion, and while it is not expected that everyone who sees the picture will remember all of the phases of practice shown, it is hoped that each person will note and remember that the veterinarian is engaged in those particular activities which that person finds of greatest interest.

"Valiant Years" is sponsored by the Associated Serum Producers. At no point does it mention the production or distribution of veterinary pharmaceutical products. It is available (16 mm. sound) to every veterinarian for use at meetings in his community. A letter addressed to any one of the member companies will secure booking of the film without charge.

Saving Grain.—The strong pleas to save grain by feeding less livestock and poultry, sincere as it may seem on the surface, is not a well-conceived relief measure, is a setback to the established system not easy to correct, a challenge to our way of life, and a threat to modern civilization. Disturbing the relations of man and his domestic animals, based on the observations of the veterinary profession, is an unsupportable philosophy.

John Waldo Connaway

1859-1947

The death, early in October of 1947, of Dr. John W. Connaway, 88, a native and life-long Missourian, removed the last of the early veterinarians chosen by public institutions to develop a veterinary service for a growing livestock industry exposed to the ravages of deadly infectious diseases. He lived to see, if not to long enjoy, the blooming of his labors into a faculty of veterinary medicine at the University he served for nearly sixty years. To those who take the trouble to understand American veterinary history, his life commemorates the earliest advance guard of the veterinary service we are still striving to complete. He belonged to the roster of pioneers comprising Robert Jennings of Ohio, James Law of New York, E. W. Prentice of Illinois, Mark Francis of Texas, M. Stalker of Iowa, C. A. Cary of Alabama, and lesser figures who upheld the dignity of veterinary science while a competent service was being slowly and painfully developed to its present level. Time unhorsed their critics who came galloping in from the unfinished barracks of the forming educational system, totally unaware that the basic purpose of their art was to render a public service in a manner becoming a learned profession, and not merely to go forth and establish a business. Although this may seem foreign to obituary material, it is not avoidable in the biography of Dr. Connaway and his contemporaries, teachers of veterinary science in his day. Born at Stockton, Mo., Nov. 18, 1859, he joined the faculty of the University of Missouri in 1887 and the staff of the Missouri Agricultural Experiment Station in 1888; graduated from the Chicago Veterinary College in 1890; joined the AVMA in 1890 and was among the prominent Middlewest veterinarians who worked for holding the annual meeting in Chicago that year; sponsored the Texas fever convention at Fort Worth (September, 1897) which launched the organization which is now the U. S. Livestock Sanitary Association. The same month Dr. Connaway made a strong plea for tick eradication before the AVMA (Nashville, 1897)—a manifestly original idea at that time. One thinks of Connaway, Paquin, Dinwiddie, and Francis, as the foremost field men in bovine piroplasmosis investigation.

He was made professor and head of the department of veterinary science, University of Missouri, in 1891 and held that office until 1937, although retired as professor emeritus in 1931. He served also on the faculties of the School of Education, College of Arts and Sciences, School of Medicine, and the College of Agriculture.

Dr. John W. Connaway

At a testimonial dinner given in his honor in 1937 by 200 colleagues and friends, the occasion was commemorated with the following citation:

> Your contributions to knowledge in the field of animal pathology have brought fame to you and the University of Missouri. You are recognized as a great teacher and your good influence on the students will be a continuing force in their lives.

To this an outside biographer would be inspired to add: "You shaped the destiny of two generations without fanfare or selfish desire."

The deceased is survived by his daughter, Miss Penelope Connaway of Farmington, Mo. His wife, Eleanor, passed away in 1936.

CURRENT LITERATURE

ABSTRACTS

Recommendations on Rabies Control

After a detailed study of the published facts about rabies and the means for controlling it, a special committee of the New York Academy of Medicine made these recommendations:

1) There should be uniform national control measures. The federal agencies concerned should draft a national eradication plan for the use of public health, agriculture, livestock, sanitary, and conservation authorities.

2) Common carrier and private transportation of dogs and other animals from one state to another should be regulated by the states and federal government, and permits therefor should be contingent upon vaccination.

3) Health provisions governing animal imports from foreign countries should be promulgated and administered by the U. S. Public Health Service.

4) Rabies, whether in man or animals, should be a reportable disease.

5) Every state should require annual licensing of dogs and the license fee should be large enough to support all expenses incurred in controlling rabies, including vaccination.

6) Annual vaccination of dogs is recommended, particularly in urban areas, and licensing in these areas should be contingent upon vaccination.

7) The procedure for vaccination recommended by the Subcommittee on Rabies of the National Research Council (Nov. 26, 1945) is endorsed, namely: a single injection of 5 cc. of vaccine in mass vaccination programs or, preferably, three injections of 5 cc. each, a week apart.

8) Control measures other than registration and vaccination, such as area quarantine during outbreaks, proper disposition of rabid animals and suspects, and impounding of stray dogs, are advocated.

9) Standard quarantine procedures should be formulated by either the U. S. Public Health Service or Bureau of Animal Industry, for dissemination to state and territorial officials.

10) Dog pounds should be available for every unit of local health jurisdiction.

11) An educational program should be launched by appropriate health authorities to explain the necessity for control measures and especially the efficacy of the vaccines now approved by the Bureau of Animal Industry and the National Institute of Health.—[*Control of Rabies. (Abridgment of a report by the Committee on Public Health Relations of the New York Academy of Medicine.) Pub. Health Rep., 62, (Aug. 22, 1947): 1215-1237.*]

Tubercle Bacilli in the Milk of Tuberculous Cattle

Ten cows were infected subcutaneously in the neck with virulent tubercle bacilli. Milk specimens were examined periodically by culture and guinea pig inoculation. Two cows were found to have tubercle bacilli in their milk after seven and thirty-six weeks, respectively. In the other 8, no tubercle bacilli could be demonstrated in the milk during twenty-two months of observation. Postmortem examination showed that only the 2 cows shedding tubercle bacilli in the milk had demonstrable lesions in the udder. The other 8 had tuberculous processes at the site of inoculation. It was concluded that tuberculous cows will shed bacilli in their milk only if the udder is involved.—[*P. Kastli: The Presence of Tubercle Bacilli in the Milk of Tuberculous Cattle. Schweiz. Arch. f. Tierheilk., 98, (March, 1947): 103-126.*]

Local Diagnostic Laboratories for Human and Animal Diseases

The trend of the hour is toward an increase in public health conscience, and it's a strong trend that calls for changes in the diagnostic services available to communities—services and facilities to replace the far-away central laboratories. The first public health laboratory was established in Canada fifty-one years ago on account of the prevalence of rabies in dogs and livestock. Since that date (1895), medical research staged the romantic development of laboratory methods, tests, serums, and specialized personnel that conquered the major plagues of man and animals. Veterinary service is so essential in public health work that nowhere in the world is it possible to find a successful public health program where animal industry is not established. There is a close relationship between the incidence of disease in man and in animals. Certain countries have become cognizant of that fact. That relationship is being studied in the United States where, as in Canada, animal enzoötics have been mastered despite their increasing numbers. There are 36 animal infections among public health

problems which require the service of veterinarians in the field of diagnosis. The 38,508 cases of human brucellosis with 1,340 deaths from 1927 to 1942, and the food poisonings of animal origin (salmonelloses) have a common basis for study as do certain virus infections common to animals and the human being.

These, among other facts, establish the wisdom of providing regional diagnostic laboratories manned by a personnel trained in the general fields of human and veterinary medicine.

Following the pattern adopted by the public health service, the Ontario Veterinary College is about to establish laboratory centers through the Province of Ontario so as to provide a more prompt diagnostic service than can be given by a central station. The ideal arrangement would be for the regional laboratory to serve both human and veterinary medicine and to be manned with competent technicians. The cost would not be prohibitive. The regional laboratory would relieve some of the burden of the hospital laboratory and could render a broader service to the community. "Is it not the task of the Canadian Public Health Association's Laboratory Section to institute such a program?" the author asks.—[*A. L. MacNabb, Principal, Ontario Veterinary College: Possible Trends in the Public Health Diagnostic Service. Canad. J. Pub. Health, 38, (Sept., 1947): 422-427.*]

Transmission of Malignant Catarrhal Fever

Attempts at transmitting malignant catarrhal fever from cattle to cattle, from cattle to sheep, and vice versa were made using material from typical spontaneous cases of the disease. Brain, spleen, lymph nodes, whole blood, and defibrinated blood were used. Not all experiments were successful. In the animals that did show symptoms, there were few gross lesions. Microscopically, the brain showed a nonpurulent encephalitis and degenerative changes in the nuclei of glossopharyngeal and vagus nerves. Numerous eosinophilic inclusions were seen in cells in the areas of degeneration.—[*P. I. Stenius: Transmission of Malignant Catarrhal Fever and the Presence of Inclusion Bodies in the Central Nervous System. Skand. Vet.-tidskr., 73. (1947): 65-84. 6 fig.*]—A. G. K.

Penicillin in Small Animal Medicine

Penicillin is indicated in staphylo-streptococci pneumonia, leptospirosis, canine distemper, and gastroenteritis of cats. It gives good results in sulfa-resistant pneumonias, and wound infections. Locally, penicillin is useful in chronic conjunctivitis, acne, and chronic rhinitis in cats, either in the form of ointments or solutions. Subcutaneous injections are preferred to avoid manifestations of painful irritation. The dose per day is from 70,000 to 100,000 Oxford units for dogs and from 15,000 to 20,000 units for cats.—[*H. Heusser and U. Kantner: Penicillin in Small Animal Practice. Schweiz. Arch. f. Tierheilk., abstr. Rev. Méd Vét., 98, (July, 1947): 330.*]

Arctic Dog Disease in Relation to Rabies

Veterinarians of the Dominion government are investigating a disease of dogs that is widespread in the Canadian Arctic, the etiology of which has caused much speculation. It has been labeled variously as rabies, as rabies complicated with other infections, as the fox encephalitis described by Green, as an unidentified virus disease, and as a possible deficiency disease or type of food poisoning. Arctic dog disease is the name tentatively given to it. Inability to obtain suitable specimens from this remote area has precluded the chance to study it on an adequate scale, though it appears certain that foxes, wolves, and other wild animals are largely responsible for its dissemination.

Dog inoculated with fox brain material.

A fox and a dog which died near Baker Lake were both found to have rabies on examination by the author. This suggested that the so-called Arctic dog disease is rabies or a complicated form of rabies.—[*P. J. G. Plummer: Preliminary Note on Arctic Dog Disease and Its Relationship to Rabies. Canad. J. Comp. Med. & Vet. Sci.; 11, (June, 1947): 154-160.*]

Rinderpest Virus in the Rabbit

At the autopsy of 176 rabbits, which were sacrificed three to seven days subsequent to intravenous or subcutaneous inoculation with a lapinized strain of the rinderpest virus, characteristic lesions were found in Peyer's patches of the intestine and in the lymph glands. As confirmed later by histologic examination, these areas consisted of grayish white points representing necrotic lymph follicles.

Necrotic lesions appeared following the third day after virus inoculation and were distinct until the seventh or eighth day. The most conspicuous picture, however, was observed on the fifth or sixth day.

The main morphologic changes found in the rabbit are the pathologic paths in the lymphatic tissues of the entire body, with permanent changes consisting of degeneration and reduction of lymphatic cells and the swelling and proliferation of reticulo-endothelial cells. These changes may lead to the formation of necrotic lesions, when the infection is severe, and such is a constant feature to be seen in Peyer's patches of the small intestine of the rabbit infected with lapinized virus. Necrotic portions of lymphatic tissues are subsequently absorbed and replaced by regeneration.

Quite similar pathologic changes are also to be seen in the lymphatic tissues of rinderpest cattle. The most important difference exists in mucosal changes of the alimentary canal. Rinderpest in cattle is characterized by an extensive severe inflammatory state of oral, gastric, and intestinal mucosa, which is usually recognized as pseudomembranous. The mucosa of the digestive canal in an infected rabbit has never revealed any severe inflammatory changes.—[*K. Jukusho and J. Nakamura: The Experimental Infection with Rinderpest Virus in the Rabbit; (II) Pathology. Jap. J. Vet. Sci., 2, (1940): 96.*]—K.F.B.

Perforation of the Abdominal Wall with Intestinal Prolapse in a Horse

A mare was seen in November, 1942, with her abdominal wall perforated by a sharp object. About 1 meter of her intestines extruded. Soiled by rolling in the dirt, it took a lot of work before the prolapsed loop could be cleaned and replaced and the abdominal wound closed. Camomile tea and vodka were prescribed, and the mare was released to her owner as a hopeless case. She did not die, but six days later a huge abscess had developed on the lower part of the abdomen; it was evacuated. Four liters of ill-smelling fluid escaped. Within six weeks she had recovered but for a hernia the size of a baby's head which developed later. A truss was applied, and she was able to deliver her colt and continue her regular work.—[*Franciszek Kuzior: Przebicie powlok brzusznych i wypadnicie jelit u konia. (Perforation of the Abdominal Wall with Intestinal Prolapse in a Horse.) Medycyna Weterynaryjna, 3, (May, 1947): 324-325.*]—L.I.H.

Newcastle Disease (Avian Pneumoencephalitis)

Virus from six Russian strains of Newcastle strains were immunologically identical with strains of Newcastle disease virus from Germany and Roumania. The Russian virus differed markedly from central European strains of classical fowl pest. Both viruses were cultured in embryos. Chickens 3 to 5 months of age were recommended for diagnostic inoculation because adults were resistant to Newcastle disease. The reverse is true of fowl pest. Yearling pigeons were susceptible to Newcastle disease and resistant to fowl pest. There was 100 per cent mortality of birds kept in contact with cases of Newcastle disease. Fowl pest was not so contagious. The syndromes and pathology of the two diseases are compared.—[*P. M. Svintzpv, A. Y. Fomina, and I. I. Ochkina, All-Union Inst. of Exptl. Vet. Med., Moscow: On the Characteristics of Atypical Fowl Pest. Veterinariya, 24, (March, 1947): 7.*]—R.E.H.

Crystal Violet Hog-Cholera Vaccine

Observations on 10,000 swine immunized with crystal violet vaccine are reported. The temperatures were checked daily for three to four weeks after vaccination on 3,000 cases. Reaction was mild. Mortality among swine vaccinated with crystal violet vaccine and subsequently exposed to cholera varied from 11.7 to 13.3 per cent in different groups. Mortality among unvaccinated swine was 37.6 to 79.1 per cent. The advantages, limitations, and contraindications of the method are given in detail. The use of live virus has been almost abandoned by the Ukrainian Institute.—[*I. I. Kulesco, Ukrainian Inst. Exptl. Vet. Med., Kharkov: On the Use of Crystal Violet Vaccine against Hog Cholera. Veterinariya, 24, (March, 1947): 10.*]—R.E.H.

Laparotomy in a Dog

Six weeks before the admission, a 6-month-old bitch had swallowed a bullet and afterwards exhibited signs of an intestinal obstruction. The bullet, located in the small intestine in the left posterior part of the abdominal cavity by palpation, was removed surgically. The postoperative course was grave, but the wound healed *per primam*. The dog was discharged ten days after the operation.—[*M. Wierzcholowski: Laparotomia u psa. (Laparotomy in a Dog.) Medycyna Weterynaryjna, 3, (March, 1947): 175-176.*]—L.I.H.

Treatment of Colics in Horses

Of the drugs used in the therapy of colics in horses, one of the oldest, atropine, does not appear to be harmless. The drugs recommended instead are: Adrianol (m-oxyphenyl-methylamino ethanol), Octin (methyl-octenylamin), Novalgin, and Caecolysin (prepared from the mucous membrane of the digestive tract). Physical treatment by gastric lavage appeared useful. Drastic purgatives are contraindicated, but mild cathartics may be tried.—[*Erwin Gratzl: Morzyska u koni i ich leczenie. (Colics in Horses and Their Treatment.) Medycyna Weterynaryjna, 3, (March, 1947): 137-140.*]—L.I.H.

BOOKS AND REPORTS

Management and Feeding of Sheep

Writing anthologies on the general and medical care of farm animals that advance the knowledge of both agricultural and veterinary sciences and at the same time meet the approval of both is a literary task that can be accomplished only by a broad understanding of their respective needs. The knack lies in rendering useful service to the one without trespassing into the specialized ground of the other to no good advantage. In this respect, the author succeeds admirably in this book. With the aid of genuinely superior illustrations of the numerous breeds of sheep, well known and rare, the book flares with elementary facts which every veterinarian ought to incorporate in his budget of knowledge. We know our Southdowns, Cotswolds, or even our Rambouillets and Merino types, but what the most of us don't know about Lonks, Exmoors, Ryelands, Panamas, Corriedales, Rommeys, Southdales, and other breeds recalls the days of not-so-long-ago when the veterinarians who could spot a dozen breeds of dogs was a wizard in the canine field. The same *critique* applies to our knowledge of swine, cattle, and cats before the era of the purebred overtook animal production. In short, inasmuch as a finished knowledge of veterinary medicine includes a working knowledge of zoötechnics, Baker's books are praised by the livestock farmer and veterinary practitioner alike because they cultivate the common ground upon which the two must meet for mutual benefit. The chapters on the medicines used for sheep, on contagious and noncontagious diseases, poisonous plants, parasites, parturition and lambing problems, docking and castration, and shearing make up a primer on ovine pathology and therapeutics that most of the general practitioners of this period will appreciate.

The author shows the practical approach to the doctor's side of the subject by dividing sheep into three classes: farm flocks, range flocks, and feeder lambs, each of which comes up with its own disease problems.

The ancient and modern history of sheep, the number of sheep in different states (about 50 million) and in the principal countries of the world (700 million), and facts about wools not generally known are among the many subjects the author has selected in making up the text of this fascinating addition to veterinary literature.—[*Management and Feeding of Sheep. By E. T. Baker, D.V.M. Cloth. 396 pages. 101 illustrations. Orange Judd Publishing Company, New York, N. Y. 1947. Price $3.50.*]

The Scientists Speak

Here is popular science, authenticated by the personal authorship of men who are leading technical progress. The ground for this book was laid in a series of commercially sponsored broadcasts over the Columbia Broadcating System, featuring the New York Philharmonic Symphony orchestra. During the intermission in the musical program, listeners were told about the achievements of science—by the men who were actually accomplishing these achievements in chemistry, physics, astronomy, geology, biology, anatomy, medicine, and related fields.

The book presents an almost identical coverage of the original talks. The composite list of narrators reads like the roster of a scientific hall of fame: Shapley, Hillier, Waksman, Pauling, Oppenheimer, Yerkes, and Sikorsky, to name but a few of the 81 outstanding men who contributed to the series.

A preface to the book by the advisory scientific committee which planned and coördinated the broadcast material indicates that the talks were received enthusiastically by millions in all walks of life. To this, we add that the 79 subjects covered will win the interest of veterinarians and their families, although countless veterinarians will be left wondering why their branch of science was overlooked. Perhaps the men who planned this series got lost in the Gargantuan stretches of their own fascinating fields—forgetting that animal health and the science of animal-food production are mighty important to human welfare. This is not a criticism of the book itself. It is merely something for the committee to think about in planning its future programs.—[*The Scientists Speak. Edited by Warren Weaver. Cloth. 369 pages. Boni & Gaer, Inc., New York 18, N. Y. 1947. Price $3.75.*]

Public Relations in Action

Departing forthwith from the generalities of the subject, this book cites 30 examples—case reports—of successful public education carried out by organizations in their own behalf and the public interest. Too few are aware that public relations work has become a mature pro-

fession with an assured future. While industrial groups have long taken the lead in maintaining public relations programs, the learned professions have also realized the importance of educating their own members as well as the public in the right direction through newspapers, magazines, books, radio, public addresses, and other means of dispersing information as to their aims and their achievements, not to mention local, state, and national representatives upon whose actions democracies depend for survival. As a matter of fact, to function successfully, a professional society has to enlighten the public on the details of its task and most assuredly keep its own personnel alerted in these respects. A book for professional men to read and obey!—[*Public Relations in Action. By Philip Leslie, public relations counsellor. 280 pages. Ziff-Davis Publishing Co., New York and Chicago. 1947. Price, $4.50.*]

U.S.L.S.S.A.: Fiftieth Annual Report

When the United States Livestock Sanitary Association met at Chicago, Dec. 4-6, 1946, it observed the golden anniversary of its convention activities. The first meeting, under the name of Interstate Association of Livestock Sanitary Boards (changed to U.S.L.S.S.A. in 1909) was held at Fort Worth, Texas, on Sept. 28-29, 1897.

Since 1909, the U.S.L.S.S.A. annually reviews, in Chicago, the intricate problems of state and interstate disease control and plans ways of augmenting its service to the livestock industry.

The proceedings contain reports of over a dozen committees and the composite knowledge of nearly three dozen papers on transmissible diseases and food hygiene. Subjects occupying topmost attention are rabies, brucellosis, tuberculosis, anaplasmosis, parasitic diseases, salmonellosis, hog-cholera vaccine, fowl typhoid, Newcastle disease (avian pneumoencephalitis), and the field of sulfonamide therapy.—[*Proceedings Fiftieth Annual Meeting of the United States Live Stock Sanitary Association (1946). Edited by Secretary R. A. Hendershott, Trenton, N. J. Paper. 303 pages. Waverly Press, Inc., Baltimore. 1947. Free to members.. Price to others not stated.*]

Los Angeles County Livestock Report

Because this annual booklet sums up the operations of veterinary service in its highest estate, there is importance in briefing its contents. It's the story of a large cosmopolitan population finding enough calories to carry on under difficulties which only scientific and energetic effort could negotiate. There is interest also in the light that the author is the president-elect of the AVMA, who is charged wih supervising the health of 131,614 cattle, 59,000 swine, $30 million worth of poultry, $300 thousand worth of sheep, and miscellaneous (rabbits, chinchilla, mink, foxes) making an overall total of $110 million. The disease problems of this array of livestock kept under more or less forced production and replacement are classified and described. One admires this annual report for its statistics, pathology, taxonomy, therapeutics, economics, and all around conquest over the diseases suffered by this unique agglomeration of livestock and poultry. —[*Twenty-third Annual Report, Livestock Department, Los Angeles County. Edited by L. M. Hurt, D.V.M., B. S. Agr. 44 pages. Public Document.*]

The Louse

The first edition of this book was published in 1939. So much new knowledge was uncovered subsequently, however, about the sensory physiology, habits, and control of lice that the text had to be revised and enlarged just five years later. The writing of this edition was completed at the start of 1945 (embodying new developments through 1944), but wartime restrictions and postwar austerity in England delayed its publication and circulation until recent months.

While the discussion is pointed to the human aspects of louse infestation (*Pediculus humanus*) with special attention to military problems along this line, it contains some information that may be of interest to veterinarians, especially those engaged in research and teaching. Chapter 5, dealing with control, is a scholarly treatise on DDT and other compounds known to be effective against this parasite.—[*The Louse. Second Edition. By Patrick A. Buxton, professor of medical entomology, University of London. Cloth. 164 pages. Illustrated. The Williams & Watkins Company, Baltimore, 1946. Price $3.25.*]

Smallpox In America

Smallpox was brought to the American mainland in 1520, nearly three centuries before Edward Jenner (1776) discovered vaccination. The expedition of the Spanish conquistador Hernando Cortez brought the infection into Mexico. The disease struck terror to the aborigines, a nonimmune race. Later outbreaks came to the continent with English, Dutch, and French explorers and almost completely wiped out whole tribes. Reportedly, spreading the disease among the Indians by sending them smallpox-infected blankets was a type of warfare—obviously, the most successful biological warfare ever waged. The first explorers and settlers were protected by a certain degree of racial immunity not possessed by the natives.—[*The Effect of Smallpox on the Destiny of Amerindian. By E. Wagner Stearn and Allen E. Stearn. 153 pages. Bruce Humphries, Boston. Price, $2.50.*]

THE NEWS

Eighty-Fifth Annual Convention
San Francisco — Aug. 16-19, 1948

"The Golden Gate in Forty-Eight" has been adopted as a slogan by the local committee for the meeting this year in San Francisco and, judging from the interest being shown everywhere, members from all over the country are looking forward to an opportunity—and a reason, perhaps—for a trip to the Pacific Coast next August. Organization of the Committee on Local Arrangements has been completed (*see* p. 70), and the planning of convention arrangements is already well advanced. Beginning with this issue, the JOURNAL will carry each month important news regarding the 1948 session. Members are urged to watch for announcements, starting in February, regarding special plans for convention travel, hotel accommodations, and other features which promise to make the San Francisco meeting an outstanding success.

The last AVMA convention in San Francisco was in 1910, although the 1942 convention was scheduled there but had to be transferred to Chicago because of the war. The 1915 session was held across the bay in Oakland, and the last meeting in California was at Los Angeles in 1930.

SPECIAL CONVENTION TOUR

A most attractive "official tour" operating on a car or special train basis, as may be the case, has been approved by the Executive Board and should appeal to those attending the convention from the East and Middlewest, particularly. Full details will be published in succeeding issues of the JOURNAL and a printed itinerary will also be mailed to members in due time. The going route is being selected

San Francisco's Palace Hotel—known the world over as one of San Francisco's landmarks.

with a view to making the special trip accessible to the greatest possible number of veterinarians and their families and will offer a choice of several return routes through famous scenic spots of the far West and Northwest. Many members will undoubtedly want to plan this trip as a vacation and the arrangements will be developed with this point in mind.

HOTEL ACCOMMODATIONS

Ample housing accommodations in San Francisco are assured, 14 of the leading hotels having already contracted about 900 rooms for AVMA convention registrants. All reservations will be handled by a housing bureau of the local committee in coöperation with the San Francisco Convention and Tourist Bureau. Because San Francisco is a year-round tourist attraction and the AVMA convention comes at the height of the summer vacation period, neither the headquarters hotel (The Palace) nor the other coöperating hotels can place an unlimited number of rooms at our disposal. However, a system of handling reservations will be used which will assure convention-goers of satisfactory accommodations within easy access of meeting headquarters.

Beginning in February, a hotel reservation blank will be published in the JOURNAL, together with full information as to rates and a diagram showing hotel locations. Members are advised not to attempt reservations until the official blank is published, since no San Francisco hotel will accept or confirm any requests for rooms during the AVMA convention except those cleared through the housing bureau.

WARNING!

The Committee on Local Arrangements and the Convention Bureau have requested (perhaps with 1947 convention temperatures in mind) that prospective attendants at the 1948 meeting be advised *not* to plan to wear summer clothing while in San Francisco. The heart of the city has a daily average temperature in July and August of about 65; the evenings may be considerably cooler so that suitable clothing, including top coats, will be in order. Remembering the "heat waves" which not infrequently coincide with AVMA conventions, a delightfully comfortable stay in San Francisco can be anticipated.

San Francisco Program

Section officers (*See* Oct. JOURNAL, p. 349) are working on a program for the Eighty-Fifth Annual Meeting to be held in San Francisco Aug. 16 to 19, 1948. Members who have appropriate information to present, or who desire that certain topics be discussed, are urged to communicate with the section officers or directly with the central office of the AVMA. Material is needed not only for the meetings

The Committee on Local Arrangements

OFFICERS

Dr. Joseph M. Arburua, *General Chairman*, 26 Fell St., San Francisco.
Dr. Sarkis T. Michael, *Vice General Chairman*, 2500 16th St., San Francisco.
Dr. Charles J. Parshall, *General Secretary*, 530 Fulton St., San Francisco.

COMMITTEE CHAIRMEN

Entertainment.—Dr. P. C. Guyselman, 1041 Broadway, Burlingame.
Exhibits.—Dr. John McInnes, 26 Fell St., San Francisco.
Garages and Airports.—Dr. Chauncey B. Miller, 1001 Ocean Ave., San Francisco.
Hotels and Housing.—Dr. Nelson E. Clemens, 183 Castro St., Hayward.
Meeting Rooms and Equipment.—Dr. Norwood H. Casselberry, 940 Regal Rd., Berkeley.
Military Activities.—Col. Joseph F. Crosby, 2295 Beach St., San Francisco.
Motion Pictures.—Dr. George M. Simmons, 1386 Golden Gate Ave., San Francisco.
Publicity and Public Relations.—Dr. Kenneth G. McKay, 1054 Cragmont Ave., Berkeley.
Reception and Hospitality.—Dr. Edward G. LeDonne, 6200 Rockwell St., Oakland.
Registration and Information.—Dr. Howard F. Carroll, 2024 Lombard St., San Francisco.
Women's Activities.—(*Co-chairmen*) Mrs. Chauncey B. Miller, 1001 Ocean Ave., San Francisco, and Mrs. Jerry R. Beach, 135 Tunnel Rd., Berkeley. (*Secretary*) Mrs. M. A. Northrup, 1371 Fulton St., San Francisco.
Budget Committee.—(*ex-officio*) Dr. Joseph M. Arburua, *Chairman;* Dr. Sarkis T. Michael, Dr. Charles J. Parshall, Dr. P. C. Guyselman, and Dr. John G. Hardenbergh.
Executive Committee.—(*ex-officio*) All chairmen of the above named functional committees.

SUBCOMMITTEE CHAIRMEN

Alumni Functions.—Dr. Ray E. Duckworth, 828 Euclid Ave., Berkeley.
Educational Exhibits.—Dr. Oscar W. Schalm, Department of Veterinary Science, University of California, Berkeley.

of the six sections but for the general sessions as well.

Preliminary plans have been laid, but every veterinarian who has a favorite technique or shortcut which his colleagues could use to advantage, or who renders a service which emphasizes the variety of activities in which veterinarians may engage, is urged to inform the section officers so that time may be allotted for him to tell the members assembled at San Francisco.

In order that a well-balanced program may be developed, and to give the local committee time to make all arrangements for meeting space and meeting room equipment, it is advisable that suggestions be sent to a member of the program committee (section officer) without delay. Each year, some papers must be refused because they do not arrive on time. Your coöperation is solicited.

Governing Boards Meet

The Board of Governors (President W. A. Hagan, President-elect L. M. Hurt and Executive Board Chairman W. R. Krill) met in Chicago on Nov. 29, 1947. The full Executive Board convened on November 30 for its semi-annual meeting. Among the items of business and reports were the following:

1) Approved the continuation of weekly radio script service on livestock health topics for constituent associations through 1948, including necessary budget appropriation. This service was being utilized by 24 state and three provincial associations as of Dec. 1, 1947.

2) Authorized the Committee on Public Relations to develop a project for an AVMA speakers' bureau for later submission to the Board.

3) Approved a recommendation of the Committee on Public Relations to produce a "Guide Book on Public Relations" in pamphlet form for senior veterinary students.

4) Voted an appropriation of about $400 to serve as an advance or loan to the Permanent Commission of the International Veterinary Congress which is being planned for 1949 in London. The veterinary associations of Sweden and Switzerland have made similar loans to help defray the organization expenses of the Congress.

5) Received reports on plans for the 1948 convention in San Francisco and approved proposal for a special train tour to the meeting. (*See* convention news elsewhere in this issue.)

6) Accepted report on hotel and meeting facilities for the 1949 convention in Detroit and set tentative date for week of August 14. This date is subject to reconsideration depending on the dates set for the International Congress in London.

7) Approved appointment by President Hagan of Drs. R. A. Kelser, B. T. Simms, and Executive Secretary Hardenbergh as official delegates to the Fourth International Congresses on Tropical Medicine and Malaria to be held in Washington, D. C., May 10-18, 1948. Dean Kelser has represented the AVMA during the past year on the Organizing Committee for the Congress and has developed a program of papers for the Veterinary Section, including participants from the United States and foreign countries.

COUNCIL AND COMMITTEE MEETINGS IN CHICAGO

Preceding and during International Livestock Exposition week in Chicago, Nov. 29 to Dec. 6, 1947, several Association committees met to plan or develop their work for the current year. Among these were:

Committee on Public Relations.—Drs. A. H. Quin, *chairman*, C. E. Decamp, Clifton D. Lowe, and Cassius Way met at the central office on November 28 and developed a full-scale program of activities.

Research Council.—The annual meeting of the Council was held at the Palmer House on December 2 and was attended by all 15 members. New officers elected for the ensuing year are: Dr. M. A. Emmerson, Iowa State College,

Night shot of San Francisco Bay Bridge looking toward San Francisco from Yerba Buena Island.

chairman, and Dr. L. E. St. Clair, University of Illinois, *secretary*.

Council on Education.—This meeting was attended by Drs. W. L. Boyd, *chairman*, James Farquharson, *secretary*, W. A. Aitken, Seth C. Dildine, G. A. Edge, W. A. Hagan, S. W. Haigler, and C. C. Hastings. Dr. M. S. Shahan, the remaining member, was absent because of his duties in Mexico on the Joint Foot-and-Mouth Disease Commission.

Special Committee on National Board of Veterinary Examiners.—Drs. W. R. Krill, *chairman*, C. W. Bower, W. L. Boyd, R. R. Dykstra, I. D. Wilson, and R. A. Kelser held several conferences during the week on the proposal (*see* the JOURNAL, Nov., 1947, pp. 443-444) to organize a national board comparable to that in medicine.

Special Committee on Nomenclature.—Drs. H. C. H. Kernkamp, *chairman*, F. R. Beaudette, Frank Thorp, Jr., I. A. Merchant, and Carl Olson, Jr., met at the AVMA office on the evening of December 2. Among other things, the Committee approved a paper by Dr. James A. Baker on "Nomenclature Revision for Epizootic Diseases of Cats" submitted for publication in the JOURNAL.

Executive Committee of Women's Auxiliary.—Several officers of the Auxiliary, including Mrs. Ashe Lockhart, *president*, Mrs. C. L. Miller, *secretary*, Mrs. A. E. Bott, Mrs. W. A. Hagan, and Mrs. J. D. Grossman, met at the AVMA office on December 4 to develop activities for the year.

President Hagan Addresses County Agents

President W. A. Hagan was one of the principal speakers invited to address the National Association of County Agricultural Agents in Chicago on Dec. 1, 1947. Other speakers included Edward A. O'Neal, retiring president of the American Farm Bureau Federation, and Albert Goss, master of the National Grange.

In his address, Dr. Hagan emphasized the mutual responsibilities of county agents and practising veterinarians in bringing to the man on the farm knowledge which will help to increase the production and lower the costs of animal food products, *viz.*, by improved efficiency in the production of animal feeds, better breeding of livestock, better methods of husbandry, and better utilization of the available means of keeping livestock free of disease. However, he pointed out the basic difference in the status of the two groups in that county agents are always salaried men whereas usually veterinarians are in private practice. Thus, any tendency of the county agent to advise stockmen on disease matters or to actually treat ailing animals, as sometimes happens, results in an understandable and justifiable resentment on the part of the veterinarian whose livelihood is affected. He urged that county agents could best serve their constituents by pointing out the highly specialized nature of disease diagnosis and treatment and the risk involved in use of patent remedies or misuse of some specific medicines and biological products. Dr. Hagan urged that steps be taken to bring about discussions between leaders in the county agent and veterinary groups with a view to solving relationship problems for the ultimate benefit of all concerned, particularly the farmer and livestock producer.

State Associations Urged to Set 1949 Dates Soon

The Veterinary Exhibitors Association recently requested state veterinary associations which feature commercial exhibits at their meetings to decide as early as possible on their 1949 dates. Because many state meetings are held at about the same time of year, veterinary supply houses find it difficult or impossible to schedule their participation in some meetings if the dates conflict, overlap, or are too close together to permit movement from one city to another.

The need for advanced planning of meeting dates was pointed out in the JOURNAL just a year ago. Several associations have indicated a willingness to coöperate in avoiding conflicts and suggested that the AVMA office act as a clearing house for information. The JOURNAL now endeavors to list all meetings about twelve months in advance, but sometimes receives word very late or not at all. The AVMA will be glad to give and receive any information furnished about meeting dates from association officers and to publish such information in the JOURNAL'S "Coming Meetings" beginning about twelve months in advance.

Conference on Suckling Pig Diseases

The third conference held under the joint sponsorship of the AVMA and the American Feed Manufacturers' Association to discuss the problem of baby pig losses met on Nov. 30, 1947, at the Hotel Sherman, Chicago.

Registered at the conference were 48 persons. This group included not only veterinarians and members of the nutrition council of the AFMA, as had the two previous conferences, but also animal husbandrymen from several agricultural colleges, swine breeders, and agricultural editors. After a full morning of discussion, 28 members reassembled for an afternoon session.

As an outgrowth of the meeting, two committees were appointed. One is composed of veterinarians and will devote its attention to an analysis of the disease problems involved. The other is a group of animal husbandrymen who will concentrate on the management and nutritional factors involved.

As the first step by the veterinary group, it was voted to try to dispel any misunderstanding regarding the complexity of the problem by referring to this group of conditions as the "Diseases and Ailments of Suckling Pigs." The analysis prepared by this committee will be integrated with that of the husbandry committee, and then all parties interested in reducing the mortality and morbidity among suckling pigs will be presented with a unified program.

Statement from Council on Education re Accreditation Status of Newly Established Veterinary Colleges

Numerous inquiries have been received from students and prospective students of the newly organized colleges and schools of veterinary medicine regarding recognition or accreditation by the Council on Education. The Council desires to state that only those colleges and schools listed in its annual report (see the JOURNAL, November, pp. 425-426) are presently accredited. To be accredited a college must meet the minimum requirements outlined in the Council's "Essentials of an Acceptable Veterinary School" as revised, December, 1946.

Furthermore, none of the newly organized veterinary colleges have been either accepted or rejected, since to date none have requested or received inspection by the Council, and since final and complete accreditation would not be in order until the full professional curriculum is in operation in the various schools. However, the Council stands ready to advise or consult with the authorities of the new schools, if desired, on any questions of organization or operation which might affect future accreditation.

Inter-Association Council Meets

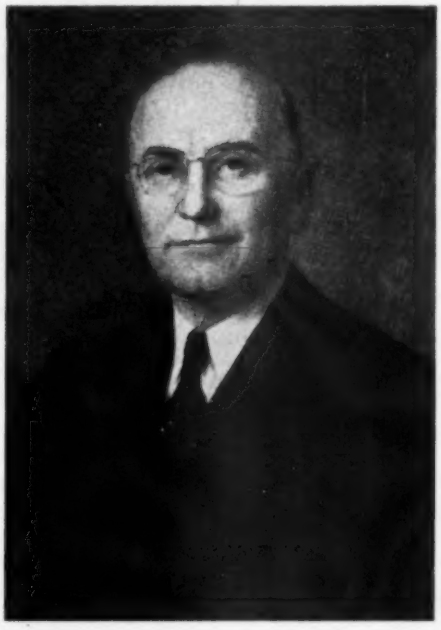
Four members of the Inter-Association Council on Animal Disease and Production assembled for a breakfast session at the Congress Hotel, Chicago, Nov. 30, 1947. Members present were Dr. E. A. Livesay, West Virginia University, *chairman*, who represented the American Society of Animal Production; Dr. L. E. Card, University of Illinois, representing the Poultry Science Association; Dr. R. C. Klussendorf, Chicago, representing the AVMA; and Dr. D. F. Green, Merck and Co., Rahway, N. J., acting as secretary. Dr. W. E. Petersen, University of Minnesota, representing the American Dairy Science Association, was abroad at the time, and Dr. R. A. Hendershott, Trenton, N. J., representing United States Livestock Sanitary Association, was busy with its annual convention.

The assembled group discussed some of the background of the Council, considered some of the problems still facing it, and agreed that the organization should continue. Although it has been inactive during the past year or more, it does remain a skeleton of what it was during the time that it was fully active. This framework provides a ready means of activating the group promptly, should need arise.

Agriculture's Annual Pageant.—The 12,585 entries of the International Live Stock Exposition—Chicago, Nov. 29-Dec. 6, 1947—set an all-time record of farm animals assembled for exhibitional purpose. In conjunction with the gala annual of the International Horse Show and the fete of the International Hay and Grain Show, held on the same campus, the Exposition represented America's agriculture in its best Sunday suit.

Dr. George H. Hart Honored

A signal honor was accorded Dr. George H. Hart (UP '03) of the University of California, and the veterinary profession in general, when his portrait was placed beside others—veterinarians and animal husbandmen recognized for outstanding work with farm livestock—in the noted gallery of the Saddle and Sirloin



—From portrait by Othmar Hoffer.

Dr. George H. Hart

Club, Chicago, on Sunday, Nov. 30, 1947. This is a sequel to his selection by the American Society of Animal Production as the recipient of the Morrison prize for outstanding achievement in that field.

John R. Hart, rector, Valley Forge Chapel, introduced his brother in a "Hart to Hart" talk. The work on which the Morrison award and presentation of the portrait was based was reviewed by C. B. Hutchison, vice-president of the University of California, where the work was done. He said that almost 100 different papers of which Dr. Hart is author or co-author are listed in the library, and that these papers are indexed in seven distinct fields of research.

In his response, Dr. Hart paid tribute to the fine coöperation of his colleagues in the University and in the profession, and to the support granted by the authorities,—financial and otherwise.

The dinner was attended by some 300 persons, including at least 25 veterinarians. The AVMA was officially represented by President W. A. Hagan, President-elect L. M. Hurt, Executive Board Chairman W. R. Krill, Board members S. F. Scheidy, E. E. Wegner, and N. J. Miller, and Assistant Executive Secretary R. C. Klussendorf.

Student Chapter Activities—Colorado A.&M. College*

The student chapter of the AVMA at Colorado A. & M. College has held three meetings a month during the fall quarter at Fort Collins. Attendance at these meetings is high although not compulsory, and AVMA keys are presened to members who attend at least 50 per cent of the meetings during the first two years. Dr. G. P. Epling is the sponsor for this year.

At the October 6 meeting, membership, program, and social plans were formulated and committee chairmen appointed. Dr. Richard F. Bourne, head of the Department of Physiology and Histology, spoke to the freshmen on the honor system in force at the College.

On October 20, 124 members attended a meeting in which plans were made for the Veterinary division's display of instruments, microscopes, etc. in a downtown Fort Collins clothing store. A radio program for station KCOL in Fort Collins was discussed.

Dr. L. E. Harris of Norden Laboratories spoke on "Practical Diagnostic Tests" at the October 27 meeting. A former assistant professor in the Clinic, Dr. Veryl Stauffer, talked on "Veterinary Medicine in Peru," relating his experiences in Peru as an employee of the Department of State.

Dr. A. D. Rankin, assistant professor of physiology and histology, spoke on November 3. A picture accompanied his lecture on "The Physiology of Respiration." The AVMA radio program was scheduled for 9 to 9:15 p.m., Jan. 22, 1948.

The November 24 meeting featured Dr. James Farquharson, head of the Department of Surgery and Clinic, speaking on "Lameness of the Horse" with pictures. The Junior AVMA dance was scheduled for December 6.

The officers for the fall quarter were Paul Partridge, *president;* R. A. Grant, *president-elect;* George Ried, *vice-president;* W. F. Hutchinson, *secretary;* L. A. Griner, *treasurer;* and John Winkler, *reporter.*

s/ WENDELL F. HUTCHINSON, *Secretary.*

Student Chapter Activities—Kansas State College

The Kansas State College student chapter of the AVMA met twice monthly during the fall quarter of 1947. Dr. J. E. Mosier is the faculty sponsor for the current year.

On October 7, Dean R. R. Dykstra, of the School of Veterinary Medicine, was the speaker with "Comments on Veterinary Medicine."

On October 21, Dr. E. K. Stonebraker of Sebetha discussed "Problems Confronting a Young Practitioner Going into Practice."

The coach of the Kansas State College football team, Mr. Sam Francis, gave a "Review of the Homecoming Game" with films on November 4.

At the November 18 meeting, Dr. Morris of the Kansas State Board of Health spoke on "Diseases Transmissible to Man."

Mr. Harvey Roots discussed "A Professional Man's Insurance" on December 2.

Dr. E. J. Frick was the guest speaker at the December 16 meeting.

The College's President Eisenhower reported on the "UNESCO Meeting in Mexico" on January 6.

The officers for the fall quarter were J. D. Fortenberry, *president;* L. H. Winn, *president-elect;* D. L. Croghan, *vice-president;* J. P. Hughes, *secretary;* T. B. Watson, *treasurer;* N. W. Rokey, *critic;* and L. J. Barger, *marshal.*

The Junior AVMA Auxiliary, wives of the Junior AVMA members, formed in 1941, now numbers 120 members.

s/J. P. HUGHES, *Secretary.*

*Resumés for fall quarter activities of Kansas State College, New York State Veterinary College, and Ohio State University student chapters appeared in the December, 1947, JOURNAL under "Among the States." Henceforth, due to excellent responses from the student secretaries, the news will be carried in this section.

Student Chapter Activities—The Ohio State University

The AVMA chapter (*see* Dec. 1947, JOURNAL, p. 535) at The Ohio State University met on November 12. Dr. J. H. Knapp (OSU '32), Columbus, spoke on veterinary practice and answered many pertinent questions. Formerly a professor at the University from 1937 to 1945, Dr. Knapp now has an active practice in Columbus.

On December 3, the chapter heard Dr. Leroy E. Johnson (OSU '42) in an account of his experiences as a range practitioner in Colorado, with valuable advice to seniors contemplating that locality for future practice. Motion pictures on removal of cancers from the eye and removal of the eye were shown.

The next meeting is scheduled for January 7.

s/ CHARLES TITKEMEYER, *Secretary.*

Thousands View Veterinary Exhibit at National Farm Show

Thousands of visitors to the National Farm Show—held at the Coliseum in Chicago, Nov. 29 to Dec. 7, 1947—were given a panoramic view of the work of the veterinary profession through an extensive exhibit sponsored by the AVMA.

This show, concurrent with the International Livestock Exposition, afforded the profession its first opportunity to represent all branches of its work before a national gathering of farmers and livestock producers. Veterinary participation in the show was arranged as a special project of the AVMA public relations program.

In staging the exhibit, which covered over 80 linear feet of floor space, the AVMA gave recognition to all major branches of the service: large animal practice, small animal practice, education, research, state livestock regulatory work, U.S. BAI, Veterinary Corps, and U. S. Public Health Service.

A feature of the display was a colorful and educational swine erysipelas exhibit. Although the exhibit had been on view before several scientific conventions, this was its first public

showing. Current plans call for another popular showing of it soon at the Dallas (Texas) Health Museum.

Among other National Farm Show educational exhibitors were the American Medical Association, American Hospital Association, National Society for Medical Research, American Meat Institute, National Dairy Council, 4-H Club, and Flying Farmers of America.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

FAULBAUM, OTTO G.
505 East "B" St., Belleville, Ill.
M.D.C., Chicago Veterinary College, 1907.
Vouchers: E. M. Lynn and J. W. Wood.

FISCHER, JOHN A.
Duncan, British Columbia, Can.
D.V.M., Ontario Veterinary College, 1946.
Vouchers: F. W. B. Smith and J. G. Jervis.

HIGGINSON, JOHN W.
Box 131, Boissevain, Man., Can.
D.V.M., Ontario Veterinary College, 1934.
Vouchers: H. H. Ross and W. L. Boyd.

HURST, FRED M.
Oxford, Iowa.
D.V.M., Kansas City Veterinary College, 1916.
Vouchers: R. E. Willie and A. W. Sprague.

KELLY, CROSBY
2924 Mills Ave., N.E., Washington, D. C.
U. S. College of Veterinary Surgeons, 1918.
Vouchers: F. M. Weadon and E. B. Smith.

MCQUEEN, OSCAR D. A.
5960 Kensington Rd., Detroit 24, Mich.
D.V.M., Ontario Veterinary College, 1940.
Vouchers: W. G. Davidson and E. D. Wasko.

PADILLA B., MANUEL R.
Escuintla, Guatemala, C. A.
M.V.D., University of Milan, 1936.
Vouchers: M. T. Cox and F. R. Rodas.

PANAGIOTIDIS, HARRY N.
Apartato 267, Santiago, Dominican Republic.
D.V.M., University of Camerino, 1944.
Vouchers: H. R. Gomez and J. G. Hardenbergh.

SMITH, RAY F.
Boswell, Ind.
D.V.M., Chicago Veterinary College, 1917.
Vouchers: D. S. Kline and J. L. Kixmiller.

STONG, JACOB
3012 McPherson St., Apt. A, Ft. Worth, Texas.
D.V.M., Iowa State College, 1941.
Vouchers: L. D. Smith and G. R. Louden.

WILLIAMS, FIRMIN E.
Box 251, Edna, Texas.
D.V.M., Texas A. & M. College, 1946.
Vouchers: W. W. Armistead and R. P. Marsteller.

Second Listing

Ballantyne, Edwin E., N.S.A.C., Truro, N.S., Can.

Chen, Hsin Kan, 328 Huron St., Toronto 5, Ontario.

Gates, Daniel W., 4808 Lackawanna St., Berwyn, Md.

Houck, Edgar L., Ste 17, Wolseley Apts, Winnipeg, Man., Can.

Le Claire, H. Adrien, Saint Adolphe, Man., Can.

Linde, Norman I., 595 Chancellor Ave., Irvington, N. J.

Pflugrad, Richard E., 82 Delaware Ave., Elsmere, N. Y.

Woodring, Fulton R., 870 S. 36th St., Lincoln 8, Neb.

Second Listing
Texas A. & M. College

Mitchell, Jerrell L., D.V.M., 7608 St. Charles Ave., New Orleans, La.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. BAI are reported as of Nov. 10, 1947, by Chief B. T. Simms.

TRANSFERS

D. Warner Anderson, from Sioux Falls, S. Dak., to Orangeburg, S. Car.
Dale W. Glascock, from McCook, Neb., to South St. Paul, Minn.
Harry W. Hall, from Cedar Rapids, Iowa, to Shreveport, La.
William D. Hoffmaster, from South St. Paul, Minn., to Winona, Minn.
Ralph A. Parsons, from Caldwell, Idaho, to Nampa, Idaho.
Melvin R. Sebright, from Bowling Green, Ohio, to McCook, Neb.
Julius A. Skordahl, from Caldwell, Idaho, to Nampa, Idaho.
Robert J. Spain, from Memphis, Tenn., to Chicago, Ill.
Frank R. Thorndike, from Orangeburg, S. Car., to South St. Paul, Minn.
Franklyn W. Timm, from Winona, Minn., to Omaha, Neb.
George W. Winkler, from South St. Paul, Minn., to Omaha, Neb.

RESIGNED

Samuel D. Bailey, Los Angeles, Calif.
Israel Berkowitz, Newark, N. J.
Bert W. Bierer, Jacksonville, Fla.
Walter D. Hofmann, San Francisco, Calif.
Leslie W. Jones, Los Angeles, Calif.
Solomon F. Loffer, Los Angeles, Calif.
Affleck J. MacGilvray, Chicago, Ill.
Mac L. McLaughlin, Los Angeles, Calif.

RETIRED

Mason A. Harp, Albuquerque, N. M.
Charles M. Lombard, Menominee, Mich.
Jay W. Reeder, Columbus, Ohio.
John B. Reidy, Harrisburg, Pa.
Walter W. Renter, Cincinnati, Ohio.

SEPARATED

Richard T. Compton.

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Nearly All Packers Retain Federal Inspection.—About 90 per cent of the medium and small-size packers and processors operating under federal meat inspection have decided to

retain this service even though they have to pay for it themselves. A spokesman for the packing industry (*Am. Cattle Producers*, Oct., 1947) says that another 7 per cent of the same group are undecided as to their course. An extremely small percentage will return to an intrastate basis or go out of business.

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Rodenticide and Herbicide Regulations.—New regulations on the sale of economic poisons went into effect on Dec. 25, 1947, replacing those based on the law of 1910. The former act applied only to insecticide and fungicides. For information apply to the Insecticide Division, Livestock Branch, Production and Marketing Administration, USDA, Washington 25, D. C.

AMONG THE STATES AND PROVINCES

Arkansas

Four Cases of Human Anthrax.—I have noted with interest the report from Arkansas on the drug-store consultation and the druggist's need for the syringes he had loaned out because of the outbreak of anthrax.

The U. S. Public Health Service received a report of 4 cases of anthrax that occurred in a family group at Palestine, St. Francis County, Arkansas. The three farmers reported ill gave as the cause of the infection the skinning of a dead cow. The one woman was a farmer's wife who had treated her husband. It was thought she became infected from her husband's lesion. There may be some correlation between this incident of anthrax in man and the indiscriminate use of biological products and syringes. It is apparent that Arkansas needs a veterinary practice act not only to protect the economic interests of its citizens but to protect their health.

s/JAMES H. STEELE, *Chief,*
Veterinary Public Health Division,
Atlanta, Ga. *U. S. Public Health Service,*
Nov. 15, 1947

British Columbia

Association Officers.—At the annual meeting of the British Columbia Veterinary Medical Association held in Vancouver on November 15, the following officers were elected: Dr. E. H. Sproston, *president;* Dr. J. G. Jervis, *vice-president;* Dr. F. W. B. Smith, *secretary-treasurer;* and Drs. S. N. Wood, J. Nelson, Gordon Davis, and J. A. Folinsbee, *executive council.*

s/ J. G. JERVIS, *Secretary.*

California

Veterinary Livestock Inspector Needed.—The California State Personnel Board will conduct examinations for a veterinary livestock inspector on Feb. 3, 1948. Applicants must possess a valid license to practise in California and must be United States citizens with at least one year's residence in the state immediately prior to the examination date. A separate request for veteran's preference must be sent to the Department of Veterans Affairs, Box 1558, Sacramento, not later than the examination date.

The salary range is $295-310-325-341-358. Places of examination will be Los Angeles, San Francisco, Sacramento, and such other places as the numbers of candidates warrant. The final date for filing applications (Form 660) is Jan. 13, 1948. Mail must be addressed to the State Personnel Board, 1015 L. St., Sacramento.

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Big Appropriations for Agriculture.—The University is planning to spend $95 million for the construction of building on its various campuses, according to Comptroller James H.

Veterinary Research Fellowships Available

The Research Council of the American Veterinary Medical Association announces that a number of veterinary research fellowships are available for the academic year 1948-49.

Holders of fellowships must be veterinarians and citizens of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year may apply for fellowships for the following year. The last date for filing applications for the year 1948-49 is March 1, 1948.

The Committee on Fellowships of the Research Council will meet early in April to consider applications and to award fellowships. Applicants will be notified of the action regarding their applications not later than May 15,—in most cases earlier.

The stipend of the fellowships will be determined by the needs of the individual fellows, the location of the schools at which they propose to work, and other factors; they will range from $150 per month upward.

For information concerning the fellowship project of the Research Council, see the February, 1946, JOURNAL, p. 107.

For application blanks and other information write:

Dr. L. E. St. Clair, Secretary
AVMA Research Council
College of Veterinary Medicine
University of Illinois
Urbana, Ill.

Corley. Of this sum, $12,410,000 is for the College of Agriculture. The veterinary science buildings at Davis get $3.5 million; plant science building $1 million; food technology $103 million; home economics, $1 million; poultry husbandry $500,000; and soils and irrigation, $600,000. In all, the Davis campus gets $8.15 million. Sizable appropriations go also to the Riverside branch.—*The California Wool Grower.*

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New Star Over Hollywood.—To be more exact it's Los Angeles and its environs, coming livestock center of the U.S.A.—stock shows, horse racing, dairy farming, turkey ranches, poultry farms, and livestock sanitary science in its highest estate. There were 1,658 cattle, sheep, and swine exhibited at the Great Western Livestock Exposition in Los Angeles last year. What's meant is that big livestock events in southern California make the headlines back East where only weather and movie stars out here were front page stuff. And, by the way, the Los Angeles stockyards celebrated its golden anniversary last fall. Don't forget to drop in on the way to, or from, the AVMA meeting in August.

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Record Price for a Yearling.—When S. A. Camp of Shafter paid $42,000 for White Hanover, b.c. 1, at the Standardbred horse sale held at the Pennsylvania State Farm Show arena in November, all previous records for a horse of that age were broken. The previous high was $37,000 paid for Victory Song by Mrs. James B. Johnson in 1944.

District of Columbia

Association Meeting.—The October 28 meeting of the District of Columbia Veterinary Medical Association was held at the Mayflower Hotel in Washington. Dr. H. S. Frankel, director of the National Research Institute in Amsterdam, Holland, spoke on "Propagation of Foot-and-Mouth Virus 'A' and 'O' for the Preparation of Vaccines," showing motion pictures and lantern slides of research procedures. Dr. Chester A. Manthei, Animal Disease Station, Beltsville, Md., discussed "Swine Brucellosis."

The officers for 1948 are: Dr. Paul C. Underwood, *president;* Col. James A. McCallam and Dr. George M. Stewart, *first* and *second vice-presidents*, respectively; and Dr. Robert Habermann, *secretary-treasurer.*

s/ WM. M. MOHLER, *Secretary.*

Florida

Association Officers.—The officers elected at the annual meeting of the Florida Veterinary Medical Association held in St. Augustine on Oct. 27-28, 1947, are: Dr. S. V. Ramsey, Miami, *president;* Dr. C. Paul Vickers, *vice-president;* and Dr. V. L. Bruns, Williston, *secretary-treasurer.*

s/KARL R. OWENS, *Resident Secretary.*

Illinois

Chicago Association.—The November 11 meeting of the Chicago Veterinary Medical Association was held at the Palmer House. Dr. A. R. Theobald, Cincinnati, Ohio, gave an illustrated talk on "Anal Abscesses and Anal Gland Removal." A motion picture provided by the Upjohn Company, entitled "Energy Release from Food," was presented.

On December 9 the Association met at the Palmer House to hear Dr. R. B. Gochenour, Pitman Moore Company, Indianapolis, Ind., speak on "Tularemia in the Dog." On the same evening the Ladies Auxiliary held their Christmas party. s/ ROBERT C. GLOVER, *Secretary.*

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Mississippi Valley Officers.—The officers for 1948, elected at the November 7 meeting of the Mississippi Valley Veterinary Medical Association held in Peoria, are as follows: Dr. W. J. Angerer, *president;* Dr. R. E. Ruggles, Moline, *vice-president;* Dr. H. R. Hornbaker, Galesburg, *secretary-treasurer;* and Drs. E. S. McClelland, E. R. Kennedy, W. L. Munson, R. M. Carter, and C. L. McGinnis, *executive board.*

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University of Chicago Pathologists Observe Federal Meat Inspection.—A group of pathologists from the Department of Medicine, University of Chicago, under the leadership of Dr. Paul E. Steiner, spent a day at the Chicago stockyards in early December, 1947, observing federal meat inspection and acquainting themselves with pathologic conditions of food producing animals.

They were guests of Swift & Co., through arrangements made by Dr. Steiner with Drs. L. D. Frederick and L. D. Jones, veterinary division, Swift & Co., Dr. R. L. Digman, BAI supervisor of federal meat inspection, and Dr. J. S. Bengston, BAI pathologist.

The pathologists, intensely interested in all they saw, were especially interested in the postmortem examinations of cattle, calves, sheep, and swine, as performed by the veterinary inspectors of the U. S. Bureau of Animal Industry. The visitors studied the gross pathology of a number of diseases, tumors, and para-

Top row (left to right)—Dr. Earl Benditt, Dr. C. Harrold Steffee, Dr. Graham A. Vance, Dr. Murray Dworetzky, Dr. C. C. Lushbaugh, and Dr. Lloyd D. Jones. Bottom row (left to right)—Dr. J. S. Bengston, Dr. Paul E. Steiner, Dr. L. D. Frederick, and Dr. R. L. Digman.

sitic conditions in various species of animals. Pathologic conditions were discussed freely with the veterinarians, and questions were asked particularly about the diseases of animals transmissible to man.

The visitors were impressed by the fact that every animal slaughtered under federal inspection received a complete and thorough postmortem examination which included the incision of lymph nodes and palpation and visual examination of all organs. The veterinary inspectors conducting the postmortem examinations were commended by the medical men for performing an essential public health service in an efficient, scientific, and professional manner. The care with which various organs and endocrine glands of animals were selected for the manufacture of medicinal and pharmaceutical preparations impressed them.

Such meetings by members of the medical and veterinary professions, for the study and discussion of matters and problems of mutual interest, are forward, progressive steps and should be encouraged; close coöperation between the two professions will prove mutually beneficial. In line with this thought, we call attention to the fact that the American Medical Association invited the American Veterinary Medical Association to prepare an exhibit on swine erysipelas for their convention in Atlantic City last June. A second invitation has been extended to the AVMA for an exhibit on rabies in animals to be shown at the January meeting of the A.M.A. in Cleveland.

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Radio Programs.—Five faculty members of the University of Illinois College of Veterinary Medicine have discussed livestock diseases on radio station WILL, University of Illinois, Urbana, since November 11. Doctors appearing on the Tuesday programs were:

Dr. C. C. Morrill, November 11: "Swine Diseases."

Dr. J. O. Alberts, November 18: "Diseases of Poultry—Their Diagnosis and Problems in Research."

Dr. P. D. Beamer, November 26: "Livestock Poisoning."

Dr. M. S. Cover, December 2: "Food and Milk Sanitation."

Dr. S. C. Schmittle, December 9: "Virus Disease of Livestock."

s/L. E. ASHELFORD.

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Famous Stock Farm.—The procurement of the registered Ayreshire herd founded by Adam Seitz of Huntley in 1900 reportedly makes the Curtiss Candy Co. Farms at Cary America's greatest stock farm, for, says the *Ayreshire Digest*, the Curtiss 3,000-acre farm now possesses top ranking herds of Ayreshires, Guernseys, Holstein-Friesians, Brown Swiss, Aberdeen Angus, and Shorthorns, not to mention grand champion bulls and cows of the Dairy Cattle Congress. Record-breaking sales are held which have brought as many as 3,000 breeders to its vast arena. Its 4-H sales bring club members from all parts of the country. Large poultry- and swine-breeding operations are sidelines.

Indiana

Michiana Association.—Dr. George L. Clark of Columbia City spoke on "Legislation and Partnerships" at the November 13 meeting of the Michiana Veterinary Medical Association held in the Hotel Mishawaka, Mishawaka.

The Association held its Christmas dinner on December 11 at the Pritchett Sea Food and Steak House near Elkhart.

s/FRANK THORP, JR.

Iowa

North Central Association.—The fall meeting of the North Central Iowa Veterinary Medical Association was held at the Wahkonsa Hotel in Fort Dodge on October 24, attended by 130 veterinarians and their wives. Dr. H. D. Bergman, dean of the Division of Veterinary Medicine, Iowa State College, Ames, discussed the topic, "Iowa State College Looks to the Future." The remainder of the afternoon was devoted to an informal discussion of swine diseases under the leadership of Dr. J. D. Ray of Omaha, Neb. Assisting him were Drs. P. C. Bennett, head of the Iowa Diagnostic Laboratory at Ames; H. C. Kreuger, Clear Lake; A. H. Quin, Kansas City; and H. E. Pinkerton, Fort Dodge.

The officers for 1948 are: Dr. S. D. Linn, Humboldt, *president;* Dr. C. L. Telleen, Gowrie, *president-elect;* Dr. B. J. Gray, Fort Dodge, *secretary-treasurer;* and Drs. C. J. Mickelson, Webster City, V. R. Howie, Manson, and G. A. Evans, Clarion, *executive board.*

Wives of the members enjoyed a luncheon and an afternoon of bridge in addition to the evening banquet and program.

s/ B. J. GRAY, *Secretary.*

Louisiana

New Southern Association Officers.—More than 300 persons attended the thirtieth annual convention of the Southern Veterinary Medical Association in New Orleans, Nov. 17-19, 1947. The next meeting will be held in Richmond, Va., Oct. 11-13, 1948.

New officers elected at New Orleans are: Dr. W. M. Coffee, LaCenter, Ky., *president;* Dr. R. S. Sugg, Auburn, Ala., *president-elect;* Dr. W. T. Oglesby, Baton Rouge, La., *first vice-president;* Dr. E. A. Davis, Columbus, Ga., *second vice-president;* Dr. A. A. Husman, Raleigh, N. Car., *secretary* (reëlected); Dr. M. R. Blackstock, *treasurer* (reëlected); Dr. W. A. Jones, Johnson City, Tenn., and Dr. Hubert Shull, Texarkana, Texas, *directors.*

Massachusetts

Association Meeting.—The Massachusetts Veterinary Association met on November 18 at the Hotel Statler in Boston for dinner and a program featuring Dr. Francis Austin of Belchertown, who spoke on "Surgery in Large Animals," with motion pictures. Dr. B. S. Killian was the chairman of a "Question Box on General Practice."

The Association met on December 17 at the Hotel Statler to hear Dr. W. H. Shannon, director of the Bureau of Livestock Disease Control, Commonwealth of Massachusetts, speak on "A Summary of the Swamp Fever Outbreak in Massachusetts." Dr. Shields Warren, pathologist for the New England Deaconess and New

England Baptist Hospitals, and assistant professor of pathology at the Harvard Medical School, discussed "The Bikini Experiment and the Effects of Atomic Energy on Animal Ecology." Dr. Warren's address was outstanding among features of the Association programs for a number of years, for he is a reserve consultant in pathology for the United States Navy, a member of the Atomic Casualty Commission, National Research Council, and, as executive officer of the Naval Medical Research Section, Operation Crossroads, supervised the experimental animals used in the Bikini experiment.

s/ C. LAWRENCE BLAKELY, *Secretary.*

Michigan

Southeastern Association.—The Southeastern Michigan Veterinary Medical Association met on November 12 at the Detroit Veterinary Supply Company. Dr. John F. Seward discussed "Amino Acids in Veterinary Medicine," and Dr. C. F. Clark of Lansing spoke on the "Distribution and Regulation of the New Brucellosis M Vaccine."

s/ FRANK THORP, JR., *Resident State Secretary.*

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Joins Kellogg Staff.—Dr. L. B. Tennison (TEX '46) has been employed to serve on the staff of the Nutrition and Feed Division, Kellogg Company, Battle Creek.

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Personal.—Dr. I. F. Huddleson of the Department of Bacteriology and Public Health, School of Veterinary Medicine, Michigan State College, East Lansing, spent several weeks in Mexico, leaving the states on November 14, at the invitation of the Institute of Social Security of the Mexican government, to teach his method of treating human brucellosis to a group of experts.

Missouri

Kansas City Association.—The November 18 meeting of the Kansas City Veterinary Medical Association was held at the Hotel Continental. Dr. Joseph E. Weinman, professor of anatomy in the Department of Veterinary Medicine, University of Missouri, spoke on "Current Problems Encountered in General Practice and Their Solutions." s/ GAIL B. SMITH, *Secretary.*

Montana

Over-Grazing.—The widely publicized charges that Montana ranchers are destroying valuable pasture lands by over-grazing is categorically denied in an article by Wallis Huidekoper in the *Montana Stockgrower* of September 15, which gives an intelligent review of the controversial subject showing that the "Broadway critics" know little of the situation about which they write. Over-grazing of what was formerly called the Great American Desert, though once a reality, ceased to be true since there were railroads to ship out accumulated cattle. The crux of the argument is that cattle and sheep ranchers are not so stupid as to destroy the source of their livelihood, no more than the small farmer of the East wantonly destroys the fertility of his fields.

Nebraska

State Association.—The Nebraska State Veterinary Medical Association held its forty-ninth annual meeting at the Cornhusker Hotel, Lincoln, on Dec. 11-12, 1947. Following President O. H. Person's address, the program was presented.

Dr. Carl Olson, Jr., University of Nebraska, Lincoln: "A Survey of Veterinarians in Nebraska."

Dr. L. M. Hutchings, Purdue University, Lafayette, Ind.: "Baby Pig Diseases" and "Swine Brucellosis."

Dr. D. A. Smith, Iowa State College, Ames: "Small Animals from Practitioners' Standpoint."

Dr. W. L. Boyd, University of Minnesota, St. Paul: "Bovine Infertility and the Place of the Veterinarian in the Practice of Artificial Insemination."

Dr. James C. Carey, West Liberty, Iowa: "Bovine Surgery."

Prof. J. E. Galloway, Drake University, Des Moines, Iowa: "Nutrition and Its Relation to Domestic Animals."

A cattle forum conducted by Dr. A. H. Quin of Jensen-Salsbery Laboratories, Kansas City, Mo., consisted of Drs. W. L. Boyd, James C. Carey, John D. Cady, Arlington, and Prof. M. L. Baker, University of Nebraska, Lincoln.

Dr. J. D. Ray of the Corn States Serum Co., Omaha, led the swine forum.

The Women's Auxiliary was entertained by bridge and games on December 11 and the annual luncheon on December 12.

Banquet toastmaster Dr. O. H. Person of Wahoo introduced the honored guests and speakers. Dr. H. V. Nothomb of Omaha spoke on "A Veterinarian's Magic," and Prof. R. B. Lindskog, Lincoln, discussed "Atomic Science in Veterinary Medicine."

s/L. V. SKIDMORE, *Secretary.*

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Association Activities.—This year the Nebraska State Veterinary Medical Association has issued 19 paid-up life memberships to its members who are 70 years old or more.

The state has been divided into eight districts for Association purposes, with three to five representatives appointed in each district to keep the Association informed as to needs of the livestock industry and problems of the profession. s/ L. V. SKIDMORE, *Secretary.*

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Monthly Bulletin.—The Nebraska BAI is now issuing a monthly bulletin to Nebraska veterinarians. Dr. E. P. Anderson, chief of the state BAI, is responsible for its origination. The work in the state BAI and various regulations in other states pertaining to practice are featured.

New York

City Association.—The Veterinary Medical Association of New York City held a meeting on December 17 at the Hotel Pennsylvania. Dr. George W. Rawson, in charge of veterinary clinical research and parasitology, Ciba Pharmaceutical Products, Inc., Summit, N. J., spoke on "The Rôle of Histamine and Allergy in Veterinary Practice."

s/C. R. SCHROEDER, *Secretary.*

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Faculty Changes.—Dr. Alexander Zeissig, former associate professor of bacteriology at the New York State Veterinary College, Cornell

University, Ithaca, resigned from the faculty in July, 1947, following a leave of absence to act as veterinary consultant of the New York State Health Department, working on rabies. Dr. George Kiesel (CORN '43), acting assistant professor, resigned Sept. 20, 1947, to enter private practice.

Additions to the faculty for the current year are: Dr. R. E. Habel (OSU '41), assistant professor of anatomy; Dr. D. D. Delahanty (CORN '44), assistant in the large animal clinic; Dr. Kenneth McEntee (CORN '44), instructor in pathology; Dr. Norman Lewis (CORN '43), acting assistant in medicine; and Dr. Francis Fox (CORN '45), assistant professor of medicine.

Ohio

Dr. Geyer, State Veterinarian.—Dr. Harry G. Geyer (OSU '36), Grove City, was appointed state veterinarian on Dec. 1, 1947. Dr. Geyer

Dr. Harry G. Geyer

worked on brucellosis eradication with the U. S. BAI in 1936-1937 and conducted a private practice until 1940, when he entered the Remount Service of the U. S. Army to spend five and a half years in Army service. He was in private practice in Grove City when he received his present appointment.

Oklahoma

International Grand Champion Steer.—After losing the stock judging contest to Iowa at the 1947 International Live Stock Exposition, Oklahoma redeemed itself when Claude Millwee, 18, of Fort Cobb, won the grand-championship with his 1,100-lb. Shorthorn steer, "Big Boy," which was generally regarded as the highest honor of the show for both a breeder and a breed.

Pennsylvania

Bucks-Montgomery Association.—Dr. Robert Stader of Ardmore was the guest speaker at the November 12 meeting of the Bucks-Montgomery Veterinary Medical Association in Doylestown. His subject was "Recurrent Luxations of the Patella," with practical demonstrations.

s/ J. G. SHUTE, *Secretary.*

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Keystone Association.—"Thoracic Surgery" was the featured subject at the November 19 meeting of the Keystone Veterinary Medical Association held at the University of Pennsylvania School of Veterinary Medicine. Dr. Mark Allam spoke on the topic with motion pictures and demonstrations.

s/ RAYMOND C. SNYDER, *Secretary.*

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Significance of Rabies Conference.—The conference of America's foremost health associations, convened in Philadelphia Apr. 9, 1947, on invitation of Dean R. A. Kelser, School of Veterinary Medicine, University of Pennsylvania, crystallized for the first time a program for the control of rabies on a national basis. It is described with favorable comments in the editorial section of the *Journal of the American Medical Association* (Nov. 22, 1947). Represented were:

American Public Health Association
American Medical Association
U. S. Public Health Association
U. S. Bureau of Animal Industry
U. S. Livestock Sanitary Association
American Animal Hospital Association
American Veterinary Medical Association

The sense of the conference was that rabies in the U. S. A. is of sufficient importance to warrant federal action through coöperating state agencies. Among the recommendations were (1) an educational program by competent authorities to enlighten the people, (2) the forming of a rabies advisory committee for promotional and operational action, (3) the use of rabies vaccines approved by the National Institute of Health and the U. S. Bureau of Animal Industry, and (4) vesting the authority to carry out control measures in the U. S. Public Health Service, the U. S. Bureau of Animal Industry, and the U. S. Fish and Wildlife Service.

This notable event comes as a reminder of the medical-veterinary coöperation pressed by Benjamin Rush in the eighteenth century as an essential public service.

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Grayson Foundation Grant to University.—The University of Pennsylvania's School of Veterinary Medicine has received a grant of $75,000 for the study of equine infectious anemia from the Grayson Foundation, Inc., it was announced on November 25 by President G. W. McClelland of the University. The grant, to be divided into $25,000 amounts for three years, will go toward research in the development of improved methods of diagnosis, prevention, and treament of the disease.

The Grayson Foundation (*see* February, 1947, JOURNAL, p. 143) was named in memory of a celebrated turfman, the late Admiral C. T. Grayson, U.S.N., physician to the late President Woodrow Wilson and surgeon-general of the United States Navy.

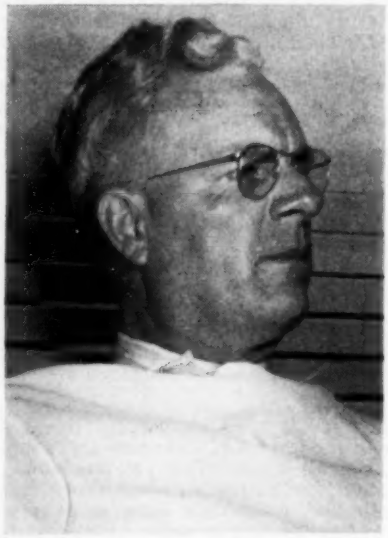
• • •

A Million for Horses.—Writes an old timer from the Alleghenies: "Seeing you print news

about the high price of animals, please be advised that the harness horses auctioned at the State Farm Show Ring recently brought $1,005,100. The average price for some 600 horses was $1,509, and the top price $42,000 which was paid for a yearling colt by a Californian! *(See California News.)*

Texas

Dr. Archie Stallings vs. Foot-and-Mouth Disease.—It can't happen here, Archie Stallings was told in veterinary college early in the 1920's. The subject was foot-and-mouth dis-



Dr. Archie Stallings

ease, which was jotted down in the curriculum as something to be talked of lightly and forgotten. After he got his D.V.M. degree (TEX '23), Dr. Stallings, luckily, did not forget. On Sept. 13, 1924, looking at a sick herd of Zebu cattle on the William S. Jacobs ranch, 20 miles southeast of Houston, he suspected that he was dealing with foot-and-mouth disease.

Louis Francke, an eyewitness of the 1924-25 Texas outbreak, in *The Cattleman* (Nov., 1947), quotes Dr. Stallings as saying, "About all I remembered about what they had told us at college was 'Foot-and-mouth disease . . . is endemic in Europe and parts of Asia and South America. None of you will ever run across it in the United States. Here is a list of reference books on the subject you can read if you're interested.'"

On Sept. 14, 1924, Dr. Stallings took some of the reference books he was told about to the Jacobs ranch. In his own words, "I'd look at the cow a while and read a while, and finally I was sure it was foot-and-mouth disease." The U.S. BAI inspector at Houston wasn't impressed with the Stallings diagnosis, due mainly to the fact that he figured the Doctor was too new in practice to know much about anything. All doubts were dispelled, however, when BAI inoculation tests confirmed the diagnosis.

Author Francke recalls that court injunctions, guns, and threats blocked Bureau eradication efforts during the two-year series of outbreaks in Texas, primarily because farmers and ranchmen did not understand the nature or the implications of the disease. The average Texas stockman of 1947, however, knows how foot-and-mouth disease, tuberculosis, tick fever, and all the other principal maladies of livestock can damage not only his own herds, but play havoc with the nation's wealth and welfare.

• • •

Highest Priced Quarter Horse.—The sale of the 3-year-old Quarter Horse, "Peppy's Pepper," for $26,500 at Fort Worth in October set a new record for a stallion of that breed. The previous high was $25,000 paid for the stallion Buckskin Joe two years ago also at Fort Worth.

Washington

Faculty Additions.—Dr. Howard F. Beardmore (ISC '41), professor of medicine, College of Veterinary Medicine, State College of Washington, has been placed in charge of the Ambulatory Clinic, College herd health, and coöperative state and college tuberculosis and brucellosis testing. Besides practice in Montana and Washington, Dr. Beardmore was recently with the Division of Dairy and Livestock, Department of Agriculture, Olympia. Previously, he was assistant professor of veterinary pathology and head of the Diagnostic Laboratory at Iowa State College, Ames.

Miss Georgie Simpson (B.S., M.S.) is a new laboratory instructor in bacteriology.

s/R. E. NICHOLS, *Dean.*

Wisconsin

Dr. Healy Retires.—After thirty-nine years as inspector in charge of the Madison office of the U. S. BAI, Dr. James S. Healy retired on

Dr. James S. Healy

Nov. 30, 1947. A graduate of McKillip Veterinary College in 1909, Dr. Healy worked in government meat inspection before an assignment to the Minnesota Transfer, which was handling western work horses. He worked in bovine tuberculosis eradication in Minnesota before coming to open the Madison BAI office in 1918. Wisconsin became a modified accredited

state on Jan. 2, 1932, after a statewide campaign against bovine tuberculosis.

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Southeastern Association.—The November 13 meeting of the Southeastern Wisconsin Veterinary Medical Association was held at the Carlton hotel in Watertown. Following dinner, Dr. Olof Norling-Christensen of Wilmette, Ill., spoke on "A Veterinarian's Trip through the Scandinavian Countries" and showed slides of the veterinary colleges and the livestock.

s/ J. O. McCoy, *Secretary.*

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Omission.—On page 537 of the December, 1947, JOURNAL, the name of Dr. George H. Hopson was inadvertently omitted from the list of veterinarians who participated in the program of the International Association of Milk Sanitarians at Milwaukee, Oct. 16-18, 1947. We are sorry.—*Ed.*

FOREIGN

Australia

Mouse-Damaged Hay.—Livestock owners in South Australia are being warned to have their horses and cattle vaccinated against botulism for protection against consuming mouse-damaged hay. Armies of mice in the Mallee district of northwest Victoria have done great damage to haystacks. [Studies of botulism in the Canadian Northwest traced the cause to the decaying carcasses of rodents and birds which seek shelter in the lower layers of stacked forage: hay and oat sheaves.—*Ed.*]

• • •

Praises Animal-Disease Control in the U.S.A.—Dr. Clunies-Ross, executive officer of the Council of Scientific and Industrial Research and parasitologist, after a three-month tour of investigation in Great Britain and the United States, on leaving California on his return flight, praised the scientific researches and control methods on animal diseases pursued in the agricultural colleges and experiment stations of the U.S.A. and in particular those of the University of California at Davis.

France

Scientific Institutes.—There are 410 institutes of scientific research in France supported by the government. They are devoted to the study of biology, agriculture, medicine, veterinary medicine, chemistry, physics, psychology, aëronautics, and other interests.

Germany

Mink Farming Revived.—German mink farmers are staging a comeback, with left-over breeding stock, according to a feature article by the Associated Press. The 440 mink breeders all of whom were practically wiped out by the war used to dispose of their small output on the local market but are preparing to have pelts on the American market next year, the *American Fur Breeder* states. Mink breeding was a small, but locally important, business in prewar Germany. It was started from breeding stock imported from Canada. In 1931, there were only 7,000 mink in the whole country.

India

Agricultural Reconstruction.—Asaf Ali, first ambassador of the Dominion of India to the United States, told the Chicago Association of Commerce in December that "starving India" is destined to feed the world when the reclamation of 100 million acres of fertile land by irrigation is completed through the intermediary of the huge hydro-electric system which will be developed during the next fifteen years. The project, known as the Bombay plan, will cost $30 billion and will restore India to the pristine glory of the long past. The medical and veterinary services developed under British-Indian coöperation through the years will be ready to enter the new development in stride. The potential resources of new dominion are no less than those of the U.S.A. nor are the ambitions of Indian veterinarians lacking.

Mexico

Kill Foot-and-Mouth Disease Inspectors.—The assassination of 8 Mexican fieldmen in the line of duty when they came to slaughter infected animals gives an insight into the difficulties encountered in the campaign of eradication in operation. The fact that the assassins were apprehended and executed indicates that law and order has not broken down.

The Netherlands

Appointment of Dr. Jansen.—Dr. Jacob Jansen, returning to The Netherlands from the eighty-fourth annual meeting of the AVMA at Cincinnati, received a cable announcing his appointment as a professor at the state university of Utrecht. With this appointment, he also becomes the successor of Professor L. de Blieck as director of the Institute of Parasitic and Infectious Diseases.

Poland

Government's Three-Year Plan.—Veterinary leaders, colleges, and the veterinary press are urged to coördinate reconstruction plans in this country with the government's three-year plan of democratic reconstruction. This plan should include postgraduate training of veterinarians; an organized campaign against prevailing epizoötics; an endeavor to increase (by scientific breeding programs) reproduction of swine, cattle, and horses to prewar levels; production in Poland of all required serums and vaccines; new hospitals and rational therapeutic methods; and veterinary administration of slaughterhouses and industries processing animal products.

With the German exodus, all accumulated stocks of serum vanished from Poland. With the return of Polish authorities, 3,000 liters of swine erysipelas antiserum were produced during 1945, 13,000 liters in 1946, and yearly production is expected to be increased to 50,000 liters at the end of the three-year plan.

It is suggested that *Medycyna Weterynaryjna*, in which these proposals were published, become a biweekly journal. s/ L. I. HALLAY.

Postwar Reconstruction.—An example of the military activities of 1945 was the destruction of the municipal abattoir at Poznan, which the city government is now attempting to restore. The abattoir employs 4 veterinary inspectors and 16 trichinoscopists. The latter indicates the importance attached to trichinosis as a public health problem. L. I. HALLAY.

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UNRRA Animal Deliveries in Poland.—In an article in *Medycyna Weterynaryjna* (Apr. and June, 1947), A. Pepkowski describes animal shipments received in Poland from the United States, Canada, and other foreign countries. Although the horses from Canada were good, those from the United States were sick, lame, and dying. Many American horses were brought in in the last stages of bronchopneumonia and in the improvised hospitals were given nux vomica in sufficient amounts to end their suffering.

The cattle brought in from the United States were of nondescript low breeds and gave small amounts of milk. The Polish farmers were most disappointed in the outward appearance of American bulls and judged them to be useless either for farm work or breeding. Cases of respiratory infections, tuberculosis, and abortion were present. Swedish cattle were highly praised.

The situation was further complicated by the shortages of veterinarians, feed, water, shelter, and drugs. Many casualties resulted from exposure and transportation difficulties. s/ L. I. HALLAY.

Russia

New Pharmacopoeia.—The first revision of the official pharmacopoeia in twenty-two years was published in 1947. Maximum therapeutic doses of 93 drugs for domestic animals were quoted from the new edition in *Veterinariya* (24, March, 1947:30). Changes in nomenclature were discussed. s/ R. E. HABEL.

STATE BOARD EXAMINATIONS

Indiana—The Indiana State Board of Veterinary Examiners will hold examinations Tuesday, Jan. 13, 1948, at 9:00 a. m. in the office of the State Veterinarian, 209 State House, Indianapolis, Ind. Application must be made in writing to the office of the State Veterinarian on or before above date. Lewis A. Snider, Chief Veterinarian on Bang's.

Minnesota—The Veterinary Examining Board for the State of Minnesota will meet Jan. 13-14, 1948, at the State Capital, St. Paul. D. B. Palmer, D.V.M., executive secretary.

COMING MEETINGS

New York State Veterinary College. Annual Conference for Veterinarians. New York State Veterinary College, Ithaca, Jan. 1-3, 1948. W. A. Hagan, New York State Veterinary College, dean.

California State Veterinary Medical Association, California Polytechnic College, San Luis Obispo, Calif., Jan. 5-7, 1947. Mr. Charles Travers, 3004-16th St., Rm. 208, San Francisco, Calif., secretary.

Wisconsin Veterinary Medical Association. Annual Meeting. Park Hotel, Madison, Wis., Jan. 6-7, 1948. B. A. Beach, Wisconsin Veterinary Medical Association, Genetics Bldg., Madison 6, Wis., secretary.

University of Pennsylvania. Annual Conference for Veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Jan. 6-7, 1948. R. A. Kelser, School of Veterinary Medicine, dean.

Ohio State Veterinary Medical Association. Deshler-Wallick Hotel, Columbus, Ohio, Jan. 7-9, 1948. F. J. Kingma, College of Veterinary Medicine, Ohio State University, Columbus, Ohio, secretary.

Intermountain Veterinary Medical Association. Salt Lake City, Utah, Jan. 12-14, 1948. M. L. Miner, Dept. of Veterinary Science, Utah State Agricultural College, Logan, secretary.

Arkansas Veterinary Medical Association. Annual meeting. Little Rock, Ark., Jan. 15-16, 1948. T. D. Hendrickson, secretary-treasurer, Rt. 5, Box 422A, Little Rock.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 15-17, 1948. H. I. Lidikay, Darlington, Ind., secretary.

Texas, State Veterinary Medical Association of. Annual meeting. Gunter Hotel, San Antonio, Texas. Jan. 19-20, 1948. E. A. Grist, secretary, Box 951, College Station, Texas.

Iowa Veterinary Medical Association. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 20-22. 1948, C. C. Franks, 602 Capital City Bank Bldg., Des Moines 9, secretary-treasurer.

Michigan State College. Annual Post-graduate Conference for Veterinarians. School of Veterinary Medicine, Michigan State College, East Lansing, Jan. 20-23, 1948. C. S. Bryan, School of Veterinary Medicine, Michigan State College, acting dean.

Oklahoma Veterinary Medical Association. Skirvin Tower Hotel, Oklahoma City, Okla., Jan. 22-23, 1948. D. B. Pellette, 505 Leonhardt Bldg., Oklahoma City, Okla., secretary-treasurer.

Mississippi State Veterinary Medical Association. Annual meeting. Heidelberg Hotel, Jackson, Miss., Jan. 23-24, 1948. S. A. Cox, Box 916, Jackson 107, Miss., secretary-treasurer.

North Carolina State College. Annual Conference for Veterinarians. North Carolina State College, Raleigh, Jan. 27-30, 1948. C. D. Grinnells, State College Station, Raleigh, N. Car., chairman.

Louisiana Veterinary Medical Association. Annual Meeting. Geology Auditorium, Louisiana State University, Baton Rouge, Jan. 27-28, 1948. C. M. Heflin, Baton Rouge, La., secretary-treasurer.

Illinois State Veterinary Medical Association. Pere Marquette Hotel, Peoria, Ill., Jan. 28-30, 1948. A. G. Misener, 6448 N. Clark St., Chicago 26, Ill., secretary-treasurer.

Kansas Veterinary Medical Association. Topeka,

Kan., Feb. 5-6, 1948. C. W. Bower, 3119 Stafford St., Topeka, Kan., secretary.

Veterinary Medical Association of New Jersey. Annual meeting. Hotel Hildebrecht, Trenton, N. J., Feb. 5-6, 1948. J. R. Porteus, P.O. Box, 938, Trenton, N. J., secretary.

Midwest Feed Manufacturers' Association. Kansas City Mo., Feb. 19-20, 1948. J. D. Dean, Midwest Feed Manufacturers' Association, 20 W. 9th St. Bldg., Kansas City 6, Mo.

American Animal Hospital Association. Hotel Atlanta Biltmore, Atlanta, Ga., April 20-22, 1948. R. E. Ruggles, P.O. Box 303, Moline, Ill., secretary.

North Dakota Veterinary Medical Association. July 14-15, 1948. F. M. Bolin, North Dakota Agricultural College, Dept. of Veterinary Science, State College Station, Fargo, N. Dak., secretary.

American Veterinary Medical Association. Palace Hotel, San Francisco, Calif., Aug. 16-19, 1948. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

American Association for the Advancement of Science. Centennial Meeting. Washington, D. C., Sept. 13-17, 1948. J. M. Hutzel, 1515 Massachusetts Ave., N.W., Washington 5, D.C., assistant administrative secretary.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Houston Veterinary Medical Association. Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Saint Louis District Meetings. Roosevelt Hotel, St. Louis, Mo., the first Friday of February, April, June and November, W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Small Animal Veterinary Medical Association of Southern California. Held the second Tuesday of each month. Norman L. McBride, Jr., 2204 Foothill Extension, Pasadena 8, Calif., secretary.

BIRTHS

To Dr. (COLO. '39) and Mrs. F. W. Andrews, Stayton, Ore., a son, Douglas Clay, Aug. 5, 1947.

To Dr. (OSU '38) and Mrs. Sidney L. King, Suffern, New York, a son, Arthur Richard.

To Dr. (MSC '46) and Mrs. G. T. O'Dell, North Branch, Michigan, a daughter, Jill Suzanne, Nov. 6, 1947.

DEATHS

★**J. W. Connaway** (CVC '90), 88, Columbia, Mo., died early in October, 1947. Dr. Connaway was an Honor Roll member of the AVMA, having been admitted in 1890. A complete obituary appears in the Editorial section of this JOURNAL.

Royal G. Flowers (ONT '06), Fort Worth, Texas, died of a heart attack late in 1947. He had been a practising veterinarian in Fort Worth for forty-six years, having entered practice in 1901 as the only graduate veterinarian in that city.

★**J. C. Gill** (MCK '04), 69, Clarksville, Tenn., died on Sept. 11, 1947, from a cardiac condition. He had practised in Clarksville since 1904. Dr. Gill was admitted to the AVMA in 1906.

★**M. Grootes** (CVC '14), 54, Twin Falls, Idaho, died in November, 1947. A native of Iowa, he practised in Minnesota and Iowa before coming to Idaho. From 1924 to 1928 he was city meat and dairy inspector of Twin Falls, and he opened a hospital in 1929. He was president of the Idaho state association until illness this year forced his retirement from office and his practice. Dr. Grootes was admitted to the AVMA in 1924.

★**Walter H. Hobbs** (OSU '14), 65, Columbus, Ohio, died in November, 1947, following an illness of eight months. A nationally known authority on small animal diseases, Dr. Hobbs had been associated with the College of Veterinary Medicine, the Ohio State University, since his graduation in 1914 and was acting dean during 1945. Since 1929 secretary of the College, he had been chairman of the department of veterinary medicine for the past five years. He was a member of Phi Zeta, honorary fraternity, and of his state and county veterinary medical associations. He was admitted to the AVMA in 1926.

D. W. Mack (ONT '86), 87, Ocean Park, Wash., died on Nov. 30, 1947. A Canadian by birth, Dr. Mack came to Appleton, Wis., to establish his first practice. In May, 1909, after a year's residence in Portland, Ore., he was appointed as the city's first meat and milk inspector, a post which he held until his retirement in 1929.

★**George M. Potter** (OSU '06), 66, Portland, Me., died on Oct. 25, 1947, after an illness of ten months. Dr. Potter had been engaged in small animal practice in Portland for many years. He had been an AVMA member since 1906.

★**E. N. Stout** (AMER '91), 77, Denver, Colo., died on Sept. 11, 1947, after a short illness. Following his graduation from American Veterinary College, Dr. Stout entered the USDA in veterinary service with the BAI, after a brief time in private practice. Retiring from government service in 1933, he was an extension veterinarian at Colorado A. & M. College until 1941. He was a member of Alpha Psi fraternity. He was admitted to the AVMA in 1920.

★Indicates member of the AVMA.

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An' Related Topics

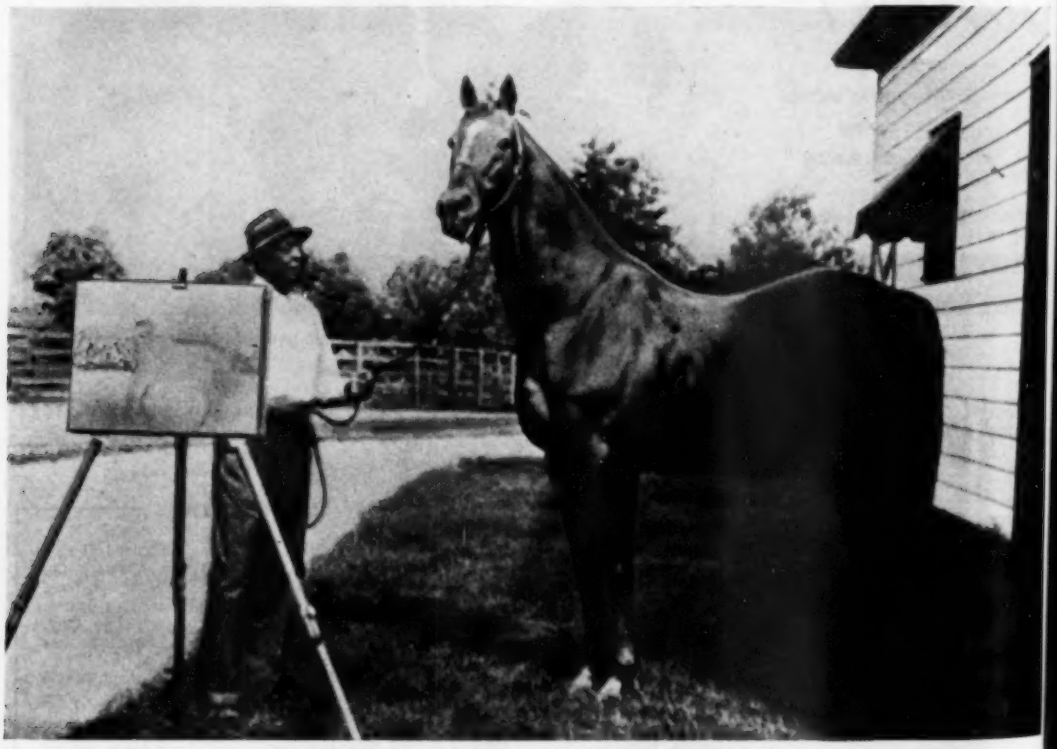
Man o' War, 1917-1947

In 1918, Major August Belmont sold Samuel D. Riddle a leggy, large-framed, chestnut colt which had just recovered from distemper. The sale price was $5,000. The colt was Man o' War, foaled March 29, 1917. Riddle, later surveying the purchase made by his agent at a Saratoga sale, was not enthusiastic, but he thought Man o' War might make a good hunter because of his bone and frame structure. However, Trainer Louis Feustel, while breaking the colt, observed his tremendous reach and decided that he had something worth a try on the track. In a total of 21 races, he won $249,465—during a period when purses were about one-third of what they are today.

Man o' War made his debut at Belmont Park on June 6, 1919, won by 6 lengths, and after that he won every race but one (he finished second in that) until he was sent to a stud farm near Lexington, Ky., at the close of 1920. He was in stud service from 1921 until 1943, when recurring colic and a weakening heart forced his retirement.

As early as last May, visitors, thousands of whom came each year to see this turf idol, had to be barred from Riddle's Faraway Farm because Man o' War was getting too weak to stand the excitement. The proud, statuesque horse was down for several days before his death on Nov. 1, 1947. It is reported that Dr. William McGee, of Lexington, put him on a sedative to make his last days easy.

Man o' War was buried November 4 in a huge oaken casket on a memorial plot



Man o' War posing for his last portrait by Vaughn Flannery.

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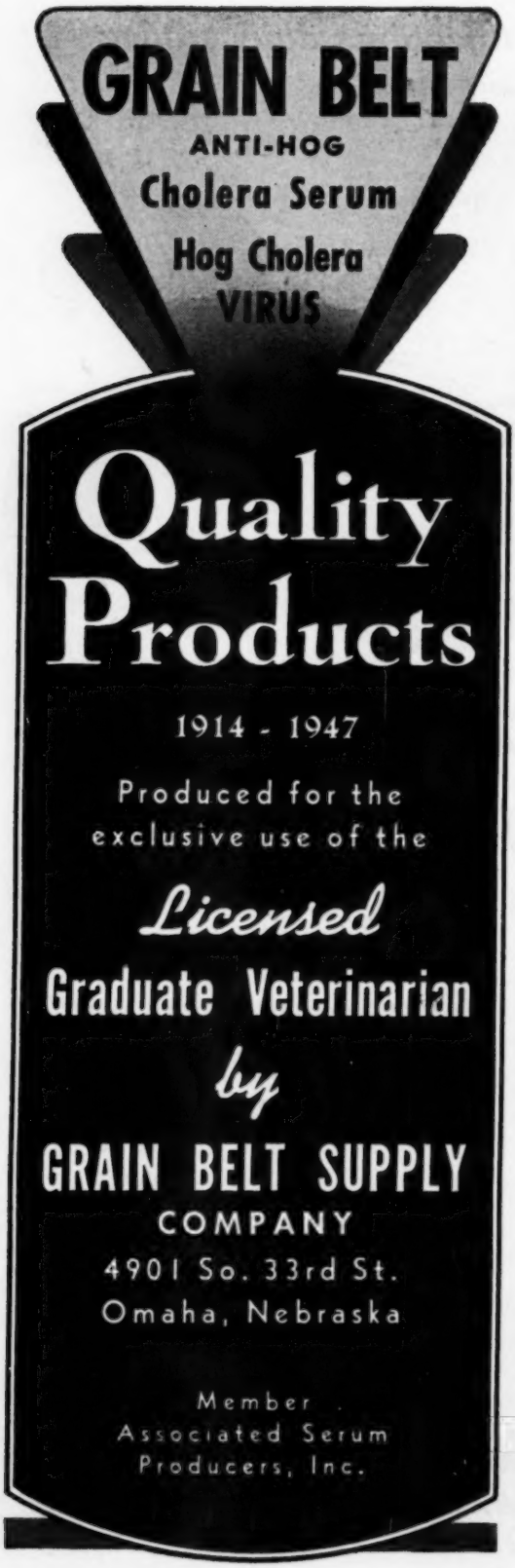


set aside for him in his old paddock. The ceremony, said *The Blood-Horse*, was "such as no one had ever seen before." A heroic bronze statue mounted on a green marble pedestal is now being prepared for the grave site.

The extreme fertility of this horse was as amazing as his track record. Several years ago, Major Bernard F. Trum, of the Veterinary Corps, found live spermatozoa in Man o' War's semen after it had stood at room temperature for twenty-four hours. His vigor and prepotency were further attested by the long line of turf winners he sired, including American Flag, Crusader, Mars, Boatswain, War Admiral, and War Relic.

Court Rulings on Trichinosis

A review of court decisions involving damage claims for trichinosis in 12 states disclosed that trichina-infected pork sold "to be cooked" for human consumption cannot be considered an unwholesome product which will give rise to an action of negligence. Such an action may be valid, however, if the product is sold as suitable for consumption without cooking, or if sold improperly cooked by a restaurant.

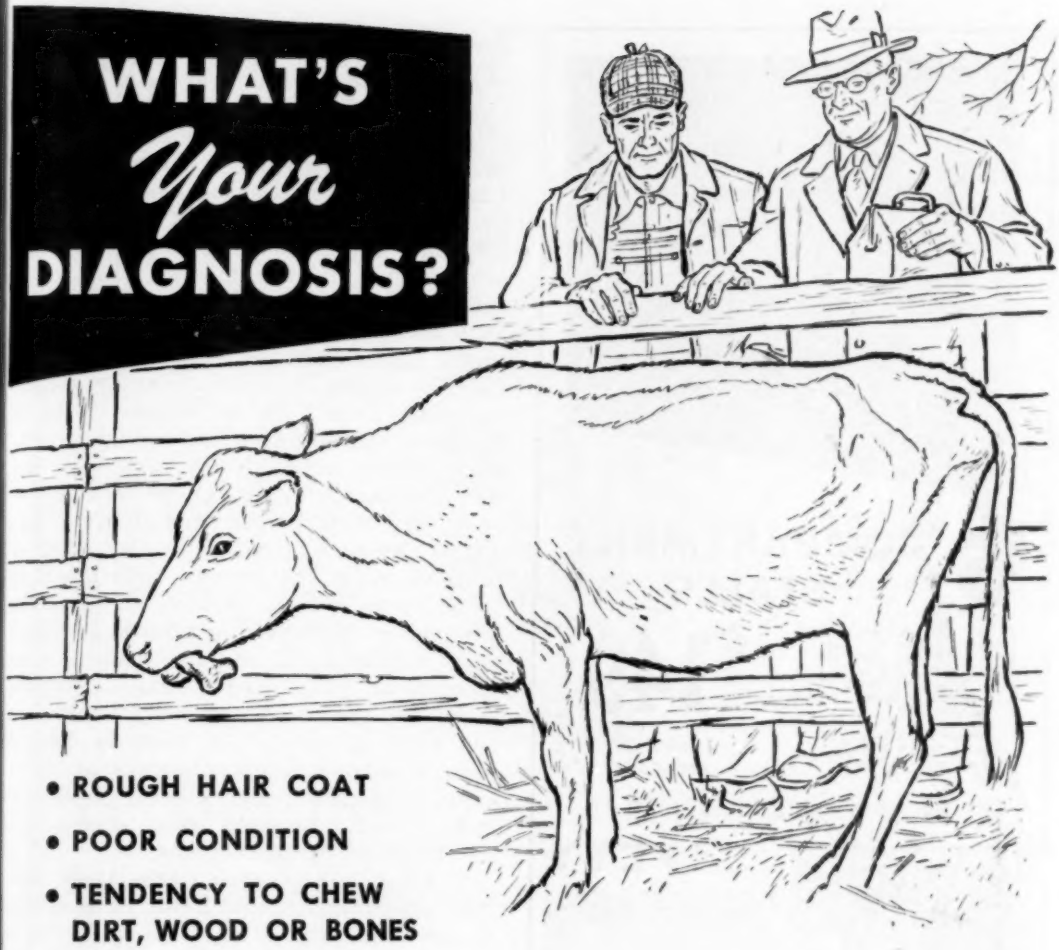
When food is sold for human consumption, there is a privity of contract between the vendor and the vendee, extending to every member of the purchaser's family. For a breach of this warranty, the injured person or his heirs may recover damages, provided that causal relationship can be shown between the disease or injury and the food. For example, if ham sold as "cooked and ready to eat" should cause trichinosis, the purchaser would have a legally sound case against the seller.—[*J. A. Tobey: Who Is Liable for Trichinosis? Food Ind., 19, (Apr., 1497): 98.*]

A good way to step up the consumption of poultry is to somehow abolish the viscera-and-all system of marketing. Lots of it doesn't appeal to taste.

Poultrymen advanced on Washington with raised hackles to protest against chickenless Thursdays on learning that Great Britain had purchased 9,000 tons of turkey from the Argentine *et al.* and none from the U.S.A.

Never before in the nation's history have dogs been used on farms to the extent that they are today.—*T. D. Burger in Am. Kennel Gaz.*

WHAT'S *Your* DIAGNOSIS?



- **ROUGH HAIR COAT**
- **POOR CONDITION**
- **TENDENCY TO CHEW DIRT, WOOD OR BONES**

You have it of course—probably phosphorus deficiency in the diet. In many sections phosphorus has become so depleted in the soil that crops do not contain enough to support normal health and growth. In other sections, there are shortages of iodine, manganese, calcium, cobalt, copper, etc.

Because you know the tremendous losses caused by faulty nutrition, you'll be glad to learn that over 100 Purina research workers are constantly studying this problem. In the case of minerals, we add enough to all Purina Chows to meet usual deficiencies.

When your clients are feeding Purina you know your animal health program is supported by sound nutrition.

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5 COMPARTMENT STALLS

Frame 1½ in. angle iron, braced, aluminum painted. Covering heavy gauge sheets. Rigid door frames of 1" O.D. pipe, dog-proof mesh filler, and welded to frame. Stands 6" off floor.
Sizes:
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Over-all size 28½"x6' wide x 5'6" high

$149

COMPLETELY ASSEMBLED

Guaranteed Satisfactory

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DOUBLE FRAME
***KENNEL* RUNS**
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Ford Double Frame Panel Runs insure SAFETY for your dogs. Chain link fabric is rust-resistant, cannot be spread; permanently locked by INNER BAR FRAME. No tie wires to rust. Clamp together. No bolt holes to match. Portable or permanent construction.

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Vivisection Hominis

Among the German war criminals convicted and hanged was the eminent malariologist Dr. Klaus Karl Schilling. His crime was clumsy attempts to immunize some 1,200 prisoners at Dachau against malaria by semicontrolled attacks of the infection. The bare facts published about this case are, however, trivia compared with the offenses committed in Poland in connection with louse-culture vaccination against typhus. The Germans kept 2,000 Polish subjects at the Institute at Cracow for the purpose. Lice were fed human blood by holding small cages of them against the skin. Since other bloods are toxic for lice, only human blood can be used in that rôle. A single person was used to feed 10,000 lice daily. After the lice were inoculated with the typhus rickettsiae, 10 to 30 of them were required to immunize one soldier. With vaccine produced at three such institutes, 2 million soldiers were vaccinated. The experiments, of course, called for the use of human controls. In one trial, 33 out of 35 controls died; 2 escaped because they were recovered typhus cases. No facts, not already known to more humane research men, came out of the weird set of experiments.

The full report of Hitler's Army Medical Department should never be published for general circulation. It ought to be suppressed as a too repugnant reflection on human conduct for the good of the human race. Like the details of the Spanish Inquisition, only the morbidly curious stoop to read it. Medical scientists shun the reports that have come to light as none of them exposed to date has added much if anything to the sum of knowledge.

One important thing comes to mind. Not a word of protest has come from the antivivisectionists.

Homeopathic Posology.—Our infinitesimal doses should no longer give birth to sly laughs by the research workers who admit beneficial action from vitamins in doses of 5 to 10 γ per 10 cc., and who tell us with difficulty about the grandeur of the mouse or Oxford unit.—*L'Homeopathie Francaise.*

The man who takes his hat off in the elevator has manners (and hair).

We had to say "No," for over five war years, when you asked for this

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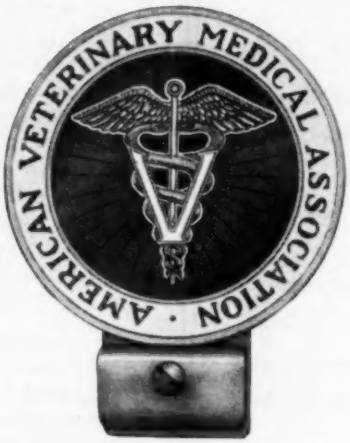

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The policy, which was developed especially for Association members two decades ago, provides expert defense against claims and suits arising out of the care and treatment of animals, and will pay, to the extent of the policy limits, all expenses and damages resulting from unfavorable verdicts.

In this suit-conscious age, such protection is not only wise but, as shown by the claim files, a practical necessity.

The insurance is placed with one of the largest and most reliable underwriters in the country.

Write at once for an application and descriptive folder, as the policy year begins on December 1.

American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

The First Medical Society

According to medical historians, there was a medical society formed at Boston in 1735, one in New York City in 1749, and a third in Philadelphia in 1765. But, these boasted firsts are debunked *per se* by Stanley B. Ward (*Yale J. Biol. and Med.*, July, 1947: 423-435) in a paper read before the Beaumont Club at New Haven, Dec. 20, 1946, citing the "Society of Physicians. Anti-Inoculators" founded at Boston in 1721 as the very first American medical society. It was organized by Dr. William Douglass, native of Scotland, for the stated purpose of opposing Jenner's smallpox vaccination which was being introduced into Colonial America. The *Boston Gazette* of Aug. 28-Sept. 4, 1721, published a letter from the founder denouncing the "News-Papers" for criticizing the "club of the physicians."

The maximum life span of mammals is approximately five times that required for the species to reach maximum growth. For example, the human being grows up to 20 years and lives up to 100; the ox grows for 4 years and dies at 20, etc. etc.

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60 grain Tablet

Fits No. 10 Capsule

Stimulant of diversified application: circulatory or respiratory depression, atony of digestive musculature, general debility.

1—100 . . . . $1.25 5—100's $5.95

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Combining 3 sulfas for increased bacteriostasis

Indicated for.....

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CERVICITIS
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Topical dressing for
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ABRASIONS
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Veterinary Triple Sulfa Cream now makes available for veterinary use, a sulfa preparation containing not one but three sulfa derivatives—Sulfathiazole, N'Acetylsulfanilamide, and N'Benzoylsulfanilamide.

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This makes Veterinary Triple Sulfa Cream more effective against a wide range of bacteria, and under a wider variety of conditions, than preparations containing only one sulfa drug.

Bacteriostatic power of this new cream is further increased by urea peroxide, which counteracts the influence of substances in body fluids that inhibit the sulfas. It also stimulates rapid healing of tissue.

Veterinary Triple Sulfa Cream is supplied in 2 sizes—1 oz. tube with removable sterilizable ear-pipe, and 5 oz. tube . . . both with removable labels. Also available, Ortho Disposable Veterinary Vaginal Applicators.

Write for descriptive folder giving complete details—pharmacology—indications.

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For sale exclusively to graduate veterinarians

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Wanted—Positions

Assistantship wanted in large or mixed practice by experienced graduate, recognized college. Married, 30 years old, owns car. Prefers West or Middlewest. References available. Address "Box P3," c/o Journal of the AVMA.

Veterinarian, assistant or similar work. Graduate Brno, Czechoslovakia Veterinarian Academy, 1928. General practice for seventeen years in Lithuania, three years in Germany. Speak Lithuanian, Russian, Czechoslovakian, German, Polish, French, a little English. Age 57, married. Address Dr. R. Buividos, 271 61st St., Brooklyn, N. Y.

KSC '44 graduate, married, Protestant, seeks location with view of permanent position or eventual ownership. Prefer mixed practice in West or Middlewest. Address "Box P 6," c/o Journal of the AVMA.

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Young veterinarian with several years of mixed practice experience and 18 months experience teaching clinical medicine wishes partnership or practice in Indiana. Address "Box P2," c/o Journal of the AVMA.

Graduate of accredited school wishes to purchase small animal practice in city of over 50,000. Address "Box P4," c/o Journal of the AVMA.

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Assistant Veterinarian for small animal practice. Address: D. S. Jaffray & Son Animal Hospital, 2534-36 W. Madison St., Chicago 12, Ill.

Young man with administrative ability wishing to make the operation of a small animal hospital a career. Must be graduate of recognized college and have good references. Eastern state. Address "Box N4," Journal of the AVMA.

Assistant, large and small animal practice, eastern state. State experience, college and date, religion. Must be good surgeon. Partnership to right man. References and photo desirable. Address "Box P1," c/o Journal of the AVMA.

Veterinarian to manage and conduct the practice of a small animal hospital in the Metropolitan New York area. Rare opportunity for the right ambitious man. State experience. New apartment available for a couple. Address "Box P5," c/o Journal of the AVMA.

(*Continued on page* 36)

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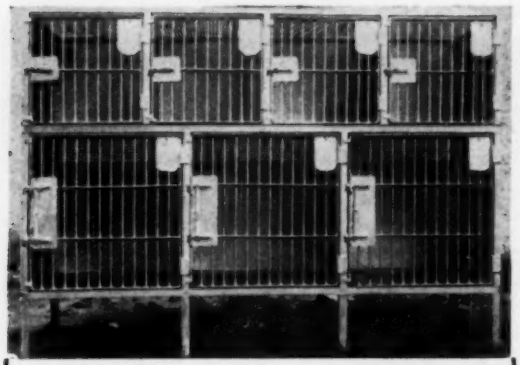
Keep your dogs frisky with *Friskies*

A Carnation Quality Product



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Send me generous FREE sample of Kasco Complete Dog Ration.

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Tulip Bulbs

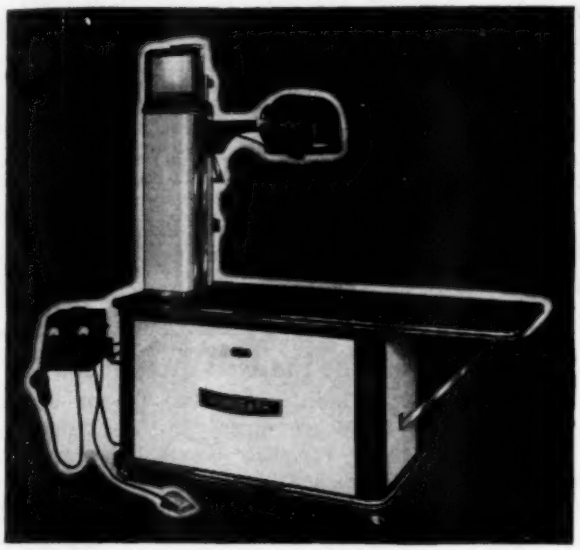
A short spell back, as old-timers well recall, European countries (mostly Germany) banned the importation of American livestock and meats on pathological grounds. Now (1947), we're behaving much the same way by curtailing the purchase of some $8 million worth of tulip bulbs annually from Holland for the ostensible purpose of preventing the importation of plant diseases. But, according to big nurserymen of Washington and Oregon, "The problem is commercial but we are trying to solve it biologically." Then the Dutch government comes back by freezing its currency to stop the sale of $141 million worth of popular oil stock to American investors. "Penny for your thoughts."

Education and Endowments

Of the universities and colleges in the United States, the 20 listed below have the largest endowments. Of the twenty, five have established veterinary schools, or those in process of being built, equipped, and staffed.

Harvard	$165,000,000
Yale	115,000,000
Columbia	88,000,000
Chicago	73,000,000
Texas	70,000,000
Northwestern	61,000,000
Rochester	53,000,000
M. I. T.	48,000,000
Duke	47,000,000
Princeton	41,000,000
Stanford	36,000,000
California	35,000,000
Cornell	35,000,000
Johns Hopkins	33,000,000
Pennsylvania	31,000,000
Vanderbilt	30,000,000
Minnesota	27,000,000
Dartmouth	23,000,000
Oberlin	23,000,000
Washington (St. Louis)	21,000,000

Cherchez la Femme.—Give the farmer—the small flock grower—a handy hunch on how to apprehend the hen that doesn't pay for her room and board and you've solved the "eat-a-hen-a-day-and-save-grain" problem worrying the watchdogs of the pantry. A large proportion of the $3 billion industry knows little and cares less about the intricate business of laying hands on the grain-eating loafers. Go out to the barnyard, pick 'em out, crate 'em up and send 'em to the market, just like that. Oh, yeah!



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REGULAR N. F. or DRENCH TYPE

1 lb. can (12 to case).....70c per lb.
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150 lb. drum any quantity..58½c per lb.

PHEN O BOLES

Accurately measured therapeutic dose of phenothiazine in one tablet for sheep, swine, cattle and equines.

25 gram—Box of 25.....$2.20
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OCTO-MINS (8 Vitamin Capsule)

Bottle of 100.....$ 1.50
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Bottle of 100.....$1.20
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Bottle of 100.....$ 2.75
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SULFONAMIDES

Sulfanilamide Powder U.S.P.

1 lb. bottle.....$1.65 per lb.
5 lb. drum..... 1.60 per lb.
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(Continued from page 32)

Graduate veterinarians for State work in Washington. Salary $300.00 per month. Give full information in application. Address Department of Agriculture, Olympia, Washington.

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ARTIFICIAL INSEMINATION INSTRUMENTS —Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

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Fair Play for the First Americans

While sobbing over the plight of faraway people we ought to work up some compassion for the Navajo Indians and other incarcerated natives. The report of Senator Langer of North Dakota, member of the Senate Committee on Indian Affairs, before the National American Indian League at Los Angeles on September 15, never made the headlines, while "Billions for Shivering Europeans" was front-page stuff in every newspaper. Ill-treated since the days of Kit Carson and galloping cavalry, the Navajo Indians are about to lose their flocks of sheep because the small acreage allotted them is being grazed bare and spoiling the land.

Again, the settlers have caught up with the Indians bent on breaking another sacred treaty.

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Ken-L-Ration contains every vitamin known to be essential to dog health.

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• You'll find that every time you recommend Ken-L-Ration, folks will return to you with new confidence. For dogs just naturally love it—and because it's so healthful, they actually thrive on it!

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Single Bottle.....	$ 2.00
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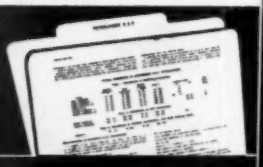
Re: Horse Meat and Sheep-Killing Dogs

Says Sam Guard's "Roundup," newsworthy column in *Breeder's Gazette*, under the headline *Viande de Cheval* (meaning horse meat, as you know):

> For instance: Look, Mr. Luckman: We've still got 8,750,000 horses in this country. You can have enough of them right now to yield you 1 billion lb. of horse meat, a staple of European butcher shops, and we'll still get along all right. In fact, we'd like that extra corn and oats and hay for our cows and sows and ewes. If you don't believe that's a sound suggestion instead of a gag ask M. Bidault, or Gen. Clay, or Dwight Griswold. It might create a scarcity of dog food, but come to think of it we could do with half as many hounds as we have, too—all eating their heads off and too many mangling innocent mutton ewes in the dead of night.

Sam doesn't say whether to start on the horse breeding farms of Kentucky and California, the bridle paths of the dog-owning town folks, or just thin out the horse population of the Cornbelt farms. We're curious to know more about this "sound suggestion." Page Wayne Dinsmore and Will Judy.

FREE



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and the

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Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies **also** should be typed **double space** and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations. — Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

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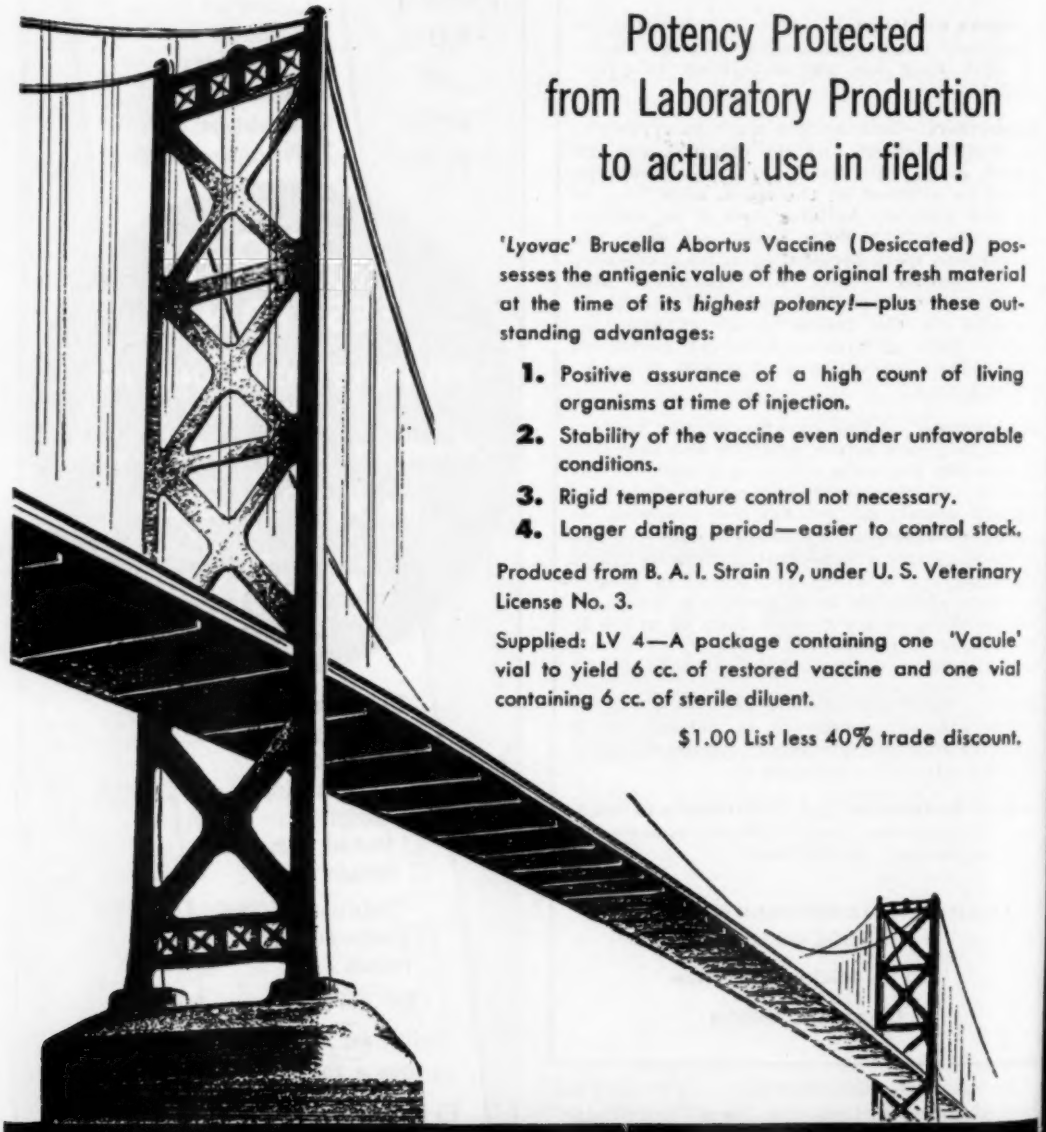

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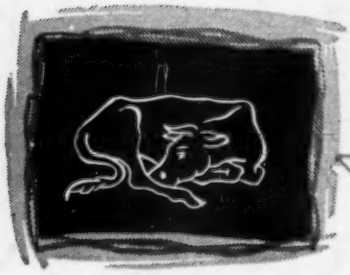

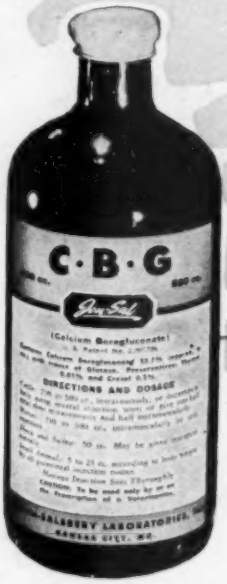

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